Developing Markets for Recyclable Materials:

Policy and Program Options

Prepared by Mt. Auburn Associates, Inc.
and
Northeast-Midwest Institute

for:
U.S. Environmental Protection Agency
in Connection with Grant No. X818723-01-0

1993

Table of Contents

1. Introduction

In the last several years, Americans have realized that they are producing, landfilling, and burning solid waste at far too great a rate. The high costs and environmental hazards associated with landfills and incinerators have prompted this concern. As a result, communities have responded by launching recycling programs to reduce the amount of waste requiring disposal.

American communities, businesses and individuals are increasingly recovering materials from solid waste for recycling. According to the National Solid Wastes Management Association, 3,500 curbside recycling collection programs existed in 1991, compared to 600 in 1989. Many of them are mandatory. At this point, virtually every state has set goals calling for dramatic increases in recycling, from the current level of about 17 percent to as much as 50 percent in less than ten years. Recycling efforts probably will expand again when Congress reauthorizes the Resource Conservation and Recovery Act (RCRA), the major federal solid waste law.

As more and more materials are recovered from the waste stream, markets are needed to put these materials to productive use. As yet, markets of sufficient size to absorb the growing stream of recyclables do not exist. The costs of failing to create such markets are high. Consequently, the challenge for officials at the federal, state, and local levels is to create the policies and programs that will develop markets of the necessary size.

> The primary audience for this handbook is state executive and legislative officials. However, local, regional, and even, federal officials may find the framework described in this book helpful in sorting through market development opportunities. For example, the discussion of barriers (Chapter 2) and the general principles for market development (Chapter 4) are relevant to all levels of government. However, Chapter 3's review of policy and program tools is specifically targeted to state officials; the appropriateness of these tools for other levels of goverment will vary.

Successful recycling efforts depend primarily on three factors:

- an adequate, reliable, and relatively clean supply of these "secondary" materials;
- demand by processors (those involved in cleaning, pulping, grinding, and other forms of material preparation), manufacturers, and exporters large enough to absorb the supply of secondary materials; and
- consumer demand for products containing secondary materials sufficient to absorb the supply.

The goal of this guide is to help state executive and legislative officials understand the various tools available to spur markets for recovered materials and recycled products. This emphasis on state-level policies for stimulating demand is chosen for several reasons. While recognizing the existence of numerous barriers to adequate collection, the most difficult barriers to recycling have been in developing markets for recyclable materials. As many local curbside recycling collection programs are required by state law, states have a responsibility to aid in the development of markets. Moreover, states have a far greater range of tools available to stimulate market development than do localities. For example, states can use information/technical assistance, grants, and loans to make markets for recyclables work more efficiently.

However, many of these tools, and the process of working with businesses to create new jobs, are far more familiar to economic development practitioners than to those in environmental protection. As a result, it's difficult for state officials charged with overseeing the implementation of recycling programs, who typically are trained in environmental management, to have a full appreciation of the variety of options and activities available to promote market development nor the pros and cons of the various options. On the other hand, while each state has an economic development agency, usually its staff is not familiar with the unique problems and needs of recycling markets.

To bridge this gap, this guide seeks to provide state recycling and economic development officials with a common understanding of market dynamics and barriers, and types of policies and programs that have been used to address them. There is no simple recipe for market development; the appropriate mix of tools must be tailored to each state's unique set of secondary materials markets. Consequently, policymakers should understand the full range of policy alternatives and decide how and when to use them. This guide will help state officials with practical information, program examples, and a way of determining market development needs so that they can tailor the options to their unique situations.

Chapter 2 provides an overview of barriers to market development and current market dynamics for 11 major secondary materials. Chapter 3 details various policy and program tools for market development, describing each option and its pros and cons. Chapter 4 suggests steps for officials to consider in selecting effective market-development tools. Finally, Chapter 5 discusses options for states to organize themselves to promote market development.

2. Barriers to Market Development

The process of recycling secondary materials—moving them from waste generators to product users—involves a number of participants:

- *waste generators*—people in homes, stores, factories, schools, and offices who separate recyclable materials for collection;
- *collectors*—public agencies or private firms that collect waste materials from generators;
- *processors*—agencies or businesses that specialize in preparing secondary materials for reuse by separating, cleaning, pulping, and grinding them for resale to manufacturers;
- *remanufacturers*—firms that transform secondary materials into new products such as old newspapers into cellulose insulation, used oil into recycled motor oil, and scrap tires into rubber asphalt;
- *investors*—lenders and venture capitalists who invest in recycling businesses; and
- *end-users*—final consumers of recycled products, again in homes, stores, factories, schools, and offices.

The three factors leading to successful recycling from Chapter 1 indicate that waste generators and collectors need to provide sufficient amounts of relatively clean secondary material. The quality of this material must be adequate to satisfy the requirements of the user. In addition, demand by processors and remanufacturers must be adequate to absorb the supply of the secondary material. And finally, demand by end-users for products containing the secondary material must be sufficient to absorb the supply. As discussed below, seven types of major barriers can detract from the three factors of successful recycling.

Types of Market Development Barriers for Recyclable Materials

The list of barriers to effective markets is most easily organized by sources of market failure. The U.S. economy relies on the free operation of markets to provide for efficient use of resources—natural, human, and financial. However, no market operates perfectly. Impediments arise that cause private markets not to provide certain goods at all or at desirable levels. These impediments are known as market failures.

The presence of a market failure provides a rationale for government action to improve the market's efficiency in allocating resources. In fact, almost every form of government intervention in the marketplace rests on a rationale of addressing a failure of the private market. Each instance of market failure requires a unique set of policy or program tools to overcome it. Policymakers must understand the various causes of market failures to select the right development tool. Causes of market failure include:

- *Imperfect flow of existing information* such as prejudice, misinformation, and a lack of information about participants, products, and markets can result in lower demand for secondary materials and recycled products and underinvestment in facilities that handle such goods.

- *Uncertainty about future markets* (quantity and quality of supplies, demand for materials and products, and government regulations) can impede market development.

- *Undervaluing of the public costs and benefits* of recycling can lead to underinvestment. For example, an investor's rate of return from a recycled paper mill may not reflect the environmental benefits of that mill. Mispricing also can result from government practices, such as subsidizing virgin materials production.

- *High transaction costs* (e.g., costs of finding customers, bringing goods to market, and drawing up contracts) can prevent or inhibit creation of markets. For example, high collection and marketing costs in rural areas often make creation of viable markets for recyclable materials in such areas difficult.

- *An initial small market* often means higher per-unit costs, which stifle market growth. So small market size, itself, becomes a barrier to developing the economies of scale and lower unit costs that would attract more buyers.

- *Aversion to risk* can lead to market failure. Markets for recyclable materials and products are both volatile and not easily predicted, which scares many investors away from the market.

- *Easy access to information* can inhibit investment in recycling research and development. Innovative products or processes, once made public, can be used by competitors at relatively low cost, deterring companies from undertaking R&D. (Patent regulation is one, although imperfect, means developed to overcome this barrier.)

Each of these sources of market failure is discussed in more detail below.

Imperfect Flow of Existing Information

In ideal efficient markets, buyers and sellers are fully informed on the features of the good or service under consideration; they fully understand the risks and rewards. In toe real world, however, existing information often is not equally available to all parties; instead, prejudice, misinformation, and lack of information abound. For instance, because "waste" has such a negative connotation, many potential buyers of secondary materials and products with recycled content avoid these items. Because many recycled products are so new, potential buyers may be misinformed about some presumed negative aspects. As a result, some manufacturers unnecessarily avoid using any type of recycled material as a substitute for virgin products. Some consumers will avoid buying recycled products because they have a misperception about their quality. For example, many consumers avoid buying recycled cellulose insulation for their homes, despite its lower cost, because of misconceptions about its low quality and potential flammability.

Trust between buyers and sellers is one factor which determines whether investments will take place. Investors, like everyone else, trust the familiar more than the unknown. Lenders and investors tend to be skeptical about products, processes, locations, and people they do not know. Financiers hesitate to finance innovative products and new production techniques, especially for unproven markets. As a result, smaller, newer, and nontraditional businesses find fewer takers for their debt and equity. Such attitudes affect bankers, venture capitalists, and government development finance agencies.

In addition to misinformation, the lack of information can impede investment by producers of recycled products in any number of ways. Suppliers and potential buyers of recycled products may not know of each other's existence. Producers of recycled products may not know the most cost-effective means of production. Municipalities, for example, may not know the best methods of composting leaf and yard wastes. Paper mill operators may not be aware of the latest deinking technologies. Consumers interested in buying recycled products may not be familiar with their high quality or know where to obtain them. In many cases, recyclers realize they need information but the cost of obtaining it appears too high. In other cases, recyclers are not aware that their knowledge is incomplete.

Uncertainty about Future Markets

Markets for secondary materials and recycled products are fraught with uncertainty caused by poor information about the future. Questions about the future supply of secondary materials, demand for recycled products, and government regulatory action can significantly impede market development.

For example, manufacturers thinking of using secondary materials may not be certain of receiving good quality and sufficient quantity of secondary materials at a relatively stable price. Simultaneously, such firms may be uncertain that markets for their recycled products will be adequate in size and stability. In early stages of product development, market demand for the product is likely to fluctuate, given current quality and costs. For instance, almost all major printing/writing paper producers are tentatively exploring markets for recycled office paper. But commitments to producing such paper in large quantity await the determination that a high-quality sheet can be produced and that high consumer demand for the product will materialize. Uncertainty over demand also can affect potential lenders.

For some materials, uncertainty over pending federal or state regulatory decisions will inhibit markets. For instance, the long wait for regulations on management of used motor oil inhibited reprocessors and rerefiners from making major investments.

Positive and Negative Externalities

In efficient markets, prices of goods and services reflect fully the costs and benefits to society. However, in the real world, prices usually only reflect the costs and benefits to the buyer and seller. The public benefits of recycling, such as the conservation of resources, are not part of the pricing process. As a result, the market has too few incentives to supply adequate amounts of clean, separated recyclable material to produce recycled products, and to buy recycled materials and products.

Waste generators usually produce much high-quality secondary material that goes uncollected. Many households and businesses see the costs of participating—taking the time and energy to separate, store, and transport the material and sometimes paying a drop-off fee for the privilege—as outweighing the benefits. For example, options for recycling used motor oil are available nationwide but fully one-third of used oil is not captured, primarily from car owners who change their own oil.

In addition, some participants in both voluntary and mandatory programs do not separate their recyclables carefully. The result is a supply of secondary materials that is difficult to process and market. To some degree, this lack of care reflects a lack of information about the importance of a clean supply. (It also may reflect a lack of appreciation of the public benefits of recycling.)

Processors and remanufacturers that use secondary materials provide public benefits by diverting a portion of the municipal solid waste from landfills. However, these benefits are not counted as "profits" by owners of and investors in such facilities. They are concerned only about the private return on investment. With no mechanism for companies to include public benefits in assessing a recycling project's return on investment, many projects with public benefits may go unfunded.

Undervaluing public benefits also can be at work when manufacturers decide not to use secondary materials solely because of the high technical costs. In many industries, particularly for smaller processing operations, automated sorting and cleaning technology is available but is too costly to install.

Most consumers do not consider the environmental benefits of purchasing non-recycled products. Because these benefits are not considered part of the product, some consumers think recycled products are overpriced, and demand is inhibited to a degree.

High Transaction Costs

In efficient markets, the cost of carrying out transactions does not keep them from occurring. In the real world, transaction costs can scuttle deals. For instance, rural areas bear high costs in recycling efforts. The costs of traveling large distances to collect, amalgamate, and distribute relatively small amounts of secondary material often prohibit rural areas from effectively marketing their secondary materials.

High transaction costs also affect bank lending practices. Processing a small loan requires as much or more time than a large one. Moreover, the costs of researching the creditworthiness of

small firms can be disproportionately large. Thus, investing in small recycling companies may not be a high priority for lenders.

Initial Small Market Size for a Recycled Product

For some recycled products, a small market can be its own worst enemy, particularly when competing goods are able to achieve large production economies of scale. For example, recycled office paper is more expensive than virgin office paper because demand for the latter is large enough that companies produce it cheaply in great quantities. Demand for recycled paper is so small that unit costs are high. Thus, low demand can beget low demand because high unit costs do not allow volume to grow enough to lower the price.

Aversion to Risk

Risk aversion that causes markets to fail exists in several forms. For example, buyers may be unwilling to risk funds on purchases of recycled products because of their perceived inferior quality. Such risk aversion stems from lack of existing information. Alternatively, the volatile and unpredictable nature of the market creates risks which inhibit investment. For instance, lenders are often unwilling to invest in a new, small company simply because the track record of the firm is short or not well-known and, therefore, deemed too risky. Because new and small firms are more likely to fail than large, well-established ones, lenders often prefer to work with larger companies simply because they perceive lower risk. Thus, new, small firms working with recyclable materials may be inappropriately denied access to financing because of aversion to risk.

In addition, the overall volatility of the price, supply, and demand of secondary materials discourages entrepreneurs, lenders, and equity investors who are risk-averse. Supply of and demand for secondary materials ebb and flow to a great degree, which allows prices to take great jumps and dives. For some materials such as paper, market volatility is fueled by foreign buyers who will stop buying in one area to force prices down, then buy enormous quantities at low prices, stockpiling what they do not need immediately. Shifts in demand and changes in price can cause levels of profitability to move up and down quickly. Risk-averse institutions shun such markets.

Public Accessibility of Information

The relative youth of the recycling industry means that the potential exists for many innovative recycled products. At the same time, numerous technical problems exist that stop further market development for existing recycled products—problems of removing contaminants, sorting mixed batches of materials, and physical weaknesses in some recycled materials such as in paper fibers recycled many times.

Despite the need to address these problems, research and development by recycling firms is sometimes slowed by fears of spending significant time and effort on a new product or process that competing companies can "reverse engineer" and gain the benefits of at a very low cost. The result is some underinvestment in research and development for recycled products.

Causes of Market Failure by Materials

Barriers to market development vary greatly among materials. Selected of recyclable materials can be discussed in four major categories. Within these four groups, there are substantial differences among materials, but enough commonality to be able to make some generalizations.

Materials with Few Barriers to Market Development

Aluminum can scrap has a very healthy market. Few barriers to market development exist, for several reasons. Aluminum cans have a very high recovery rate—all material recovered is readily reused by the aluminum industry. It is an easily identifiable, relatively homogeneous material generated primarily in the home, so separation and curbside recovery are easily accomplished. Bottle bills have added to the recovery rate in some states. Contaminants are relatively easily dealt with. The aluminum industry has an incentive for promoting recycling—the secondary material is more cost-effective to use than virgin stock because of the enormous energy costs of creating aluminum. High profile recycling also gives aluminum can manufacturers positive public relations. The aluminum industry is also well organized, through trade associations, to stimulate the development of the infrastructure for recycling.

Steel can scrap also is currently enjoying strong market demand, for many of the same reasons as aluminum can scrap. It can be easily separated from other material with the use of magnets. Steel can scrap also can be used as input for a wide range of recycled steel products including steel cans, casted metal products, and steel produced in mini mills. These factors are being augmented by industry desires to market steel cans as a recyclable material—the Steel Can Recycling Institute is working aggressively on both the supply and demand side to increase recycling rates. While tin contaminants are of concern to producers, cans may be included in the scrap mix in adequate proportions to accommodate a high recycling rate.

The primary limitation on steel can recycling has been the lack of curbside recycling programs—as new programs are added, the new supply is readily absorbed. While market conditions are currently favorable, the market is relatively young and long-term prospects are uncertain. For example, commitment to recycling among steel producers may diminish if contaminants emerge as a long-term problem or if increased market share for container lines takes on a lower priority.

Materials with Barriers to Recovery

The barriers to the development of markets for old corrugated containers (OCC), used motor oil, and lead-acid batteries all occur on the supply side. Because of their high value and low cost relative to virgin, these materials are desired and readily absorbed by remanufacturers, who use them to make similar products. Corrugated containers are used almost entirely by the paperboard industry for new corrugated and cardboard packaging. Used oil is reprocessed to make industrial fuel or rerefined to make new motor oil. The lead and plastic from lead-acid batteries are used to make new batteries.

Markets fail to develop for these three materials because of difficulties in recovery. Used oil and batteries have not readily been made part of residential curbside recycling programs.

Recovery of used oil and batteries requires the user to bring the waste product to a garage, store, or other facility for handling. About one-third of motor oil and 20 percent of batteries are not recovered because do-it-yourselfers and small businesses fail to bring the waste products to a recovery facility. Corrugated containers are generated primarily in the workplace. Though recovery rates are relatively high because of the intrinsic value of the material, 43 percent still is not recovered.

Generators of these three waste materials become sources of market failure in part because they ignore the environmental benefits of proper recovery. They may think that bringing the waste products to a recovery facility is too difficult or costly for them to be bothered or they may have bad information about how to handle or where to take these materials. Some observers believe that it will be difficult to increase recovery of OCC because of the high costs of collecting additional tons (the OCC that is relatively cheap to collect is already recovered).

Like the metal industries, the industries using OCC, used oil, and lead-acid batteries have a strong profit incentive for encouraging recycling. Unlike the metal industries, however, these three industries do not have an infrastructure in place for effective recycling nationwide.

Materials with Barriers to Demand

Recovery systems for old newspapers (ONP), scrap tires, and leaf and yard waste are easily put in place and recovery rates are growing. However, for each of these materials, demand has been slack.

ONP is a relatively low-value commodity. Although it has a number of potential reuses (e.g., recycled newsprint, filler in paperboard, animal bedding) manufacturers tend not to include it when substitutes are available. The sources of market failure have included poor information about the performance of ONP as well as products made from ONP, uncertainty about the quantity and quality of supply, and undervaluing of the environmental benefits of reuse. Recently, states have negotiated with newspaper publishers to increase the use of recycled newsprint. Newsprint mills are responding to this increased market demand. The future of ONP markets looks much more promising as a result.

Scrap tires have not been perceived as a valuable commodity. Two-thirds are landfilled, stockpiled, or dumped, creating a potential environmental hazard. The remainder are reused, retreaded, burned for energy, or exported. Recycling uses include retreads, rubberized asphalt, and low-value rubber products such as doormats, planters, and items for specialized commercial applications. While research has found several interesting processes for separating the valuable components of tires and more are on the drawing boards, they have not become widespread. Despite the variety of uses and potential uses, large markets have not developed. Barriers to the recycling of tires include poor information about possible reuses, lack of information on the environmental benefits of reuse, uncertainty about tire-component quality, and avoidance of risks to investing in experimental tire recycling processes and facilities.

Compost made from leaf and yard waste can be used in a wide range of applications from soil enhancements to top dressing. However, demand is limited for several reasons. Some homeowners lack information on or interest in proper separation and so produce low-quality yard waste. Many municipalities do not know how to produce or market high quality compost.

Materials with Barriers to Separation and to Demand for Mixed Grades

The markets for scrap plastics, glass containers, and used office paper share a common dynamic. While each material is greatly desired by manufacturers, each also is difficult to separate by type. The result is the generation of large amounts of low-value mixed grades for which there is little demand. National industry trade organizations are actively seeking to promote recycling for these materials, but they have not yet overcome the barriers.

To be reusable for making new glass containers, used glass containers must be separated by color and have low levels of contamination. Such a high level of separation requires hand-sorting, which is slow and expensive. Markets for mixed glass are relatively limited. Moreover, this country has a surfeit of green glass, primarily due to imports. While 23 percent of glass container waste is green, only 13 percent of U.S. glass production is green. So for a portion of green glass waste, no demand exists.

Scrap plastics come in a wide variety of resins such as HDPE, PET, polypropylene, and polyvinyl chloride. Single-resin scrap plastics are relatively valuable, but mixed plastic scrap is not. However, items made from different plastic resins are not easily distinguished so that appropriate separation of resins cannot be done by the average homeowner except to a limited degree (separating milk jugs and soda bottles, for example). The partial adoption of a resin coding system has made separation easier. Even so, undervaluing of the environmental benefits of using scrap plastics is a source of market failure. The problem has worsened with a recent drop in virgin plastic prices due to overcapacity. In addition, recycling technology which could bring down the cost of using scrap is underdeveloped; companies apparently believe they could not keep the results of the technology proprietary. Finally, uncertainty and risk aversion combine to block investment in the plastics recycling business. Essentially, every major source of market failure exists to inhibit market development for plastics.

Used office paper has problems with both supply and demand. Separation of the standards required by paper manufacturers is difficult to achieve. At present, recycled printing and writing-paper manufacturers, for instance, can use only paper with oil-based inks, requiring the separation of paper with plasticized inks (those produced by copiers and laser printers). Paper also must be separated by color and fiber type (e.g., low-grade paper such as ONP cannot be mixed with high-grade white paper). On the demand side, paper manufacturers have sunk costs in virgin forests and virgin-paper production facilities that limit their desire to shift to recycled materials. Poor information exists about the opportunities for third-party deinkers to provide pulp to manufacturers. Many printing and writing mills lack information about state-of-the-art deinking technology and techniques. Paper distributors, commercial printers, and consumers have inadequate information about the quality and sources of recycled paper. Due to small market size, consumers must pay higher prices for recycled paper than virgin and balk at doing so.

This four-part grouping of 11 materials shows several dynamics that tend to explain the extent of market development. Essentially, markets are developed to the extent that the materials are easily separated, they have high value in their separated form, the industry reusing the material sees profit in using secondary over virgin materials, and the industry and its trade association have been active in promoting the development of a recycling infrastructure. To date, state government market development action has had a truly major, transforming impact on the

market for only one material, ONP, and even that impact will be felt more in the future than the present.

In the next chapter, we review the range of policy and program tools available to address the barriers to market development due to inadequate demand. Methods for addressing low recovery and separation rates may be found in other resource material.

3. State Policies to Promote the Use of Secondary Materials

Six types of tools are available to state government to overcome the barriers identified in Chapter 2:

- *Information and technical assistance:* the state stimulates the delivery of better information about recycling markets to entities collecting, using, or potentially using the material;

- *"Buy Recycled" programs:* the state seeks to create stable markets and stimulate investment for recycled products through its purchases of recycled products;

- *Financing:* the state seeks to stimulate investment in recycling market activity by providing direct financing to businesses that use recovered materials;

- *Grants:* the state seeks to stimulate investment in recycling-market activity by providing grants to businesses, universities, and local governments;

- *Taxes and fees:* the state seeks to affect the pricing of secondary materials, recycled products, and their competitors through adjustments in the tax system and imposition of targeted fees; and

- *Regulation:* the state prescribes the behavior of those involved in the collection, processing, remanufacture, or purchase of secondary materials.

This chapter describes how each tool can be used effectively, which market failure each is best suited to address, and current examples of state initiatives for each.

Information and Technical Assistance

Information and technical assistance programs can be low-cost, no-risk ways of supporting markets for recyclables and helping recycling businesses to thrive. For small start-up ventures especially; technical assistance can be even more important than financial incentives.

Information and technical assistance programs can be targeted to several different audiences including generators, collectors and processors, and manufacturers that use or could potentially use recovered materials. Other state or local agencies that could foster recycling, for example, through purchases or other activities, also would benefit from information about recycling.

Such programs are appropriate when the flow of information is imperfect. A state can choose to channel recycling information through an existing program that already delivers information and technical assistance on other issues, or it can start a new program tailored to the audience the state wants to reach. Because of the uniqueness of the information required, states

rightly tend to establish new information and technical assistance programs designed specifically to address recycling market information problems. However, many recycling businesses also face information problems more generic in nature, such as how to create a business plan and how to access capital. All states have some form of business technical assistance program to provide help in such cases. Below, a variety of information and technical assistance programs are reviewed.

Market Updates

To inform business people and public officials about recent developments in recycling markets, some states publish periodicals. Articles, typically written by state officials, describe general market conditions for materials recovered in the state. The newsletters also summarize state efforts to address recycling market needs. The California Integrated Waste Management Board publishes the "Quarterly Report on California's Recycling Markets." New York State's Office of Recycling Market Development publishes a bimonthly report on the status and outlook of markets for certain materials and distributes other news, including "The Market," a monthly newsletter on markets in and around the state.

Recycling Market Directories

To link sellers to prospective buyers, virtually every state has some kind of directory listing businesses that use recyclables. The purpose of the directories is to aid businesses, community groups, and public officials responsible for solid waste management in identifying markets for recyclable materials. Typically, the directories list companies in the state or region that buy, sell, or process recyclable materials.

The format and amount of detail of the directories varies. For example, Vermont's printed directory provides information on prices, freight arrangements, and market specifications for paper, scrap metal, glass, and plastic. New York maintains a computerized market directory and fields inquiries from local government and businesses. Illinois publishes and updates a regional market directory that includes detailed listings of brokers and companies that purchase common residential and commercial recyclables and their processing requirements.

Waste Exchanges

Several states operate waste exchanges to match waste generators with recyclers by centralizing information about recyclable materials available and wanted. Typically, the exchange is operated by a nonprofit organization with government funding. The organization essentially functions as a clearinghouse: businesses submit descriptions of recyclable materials available or needed to the exchange, which disseminates the information either in a published catalogue or computerized database. Accuracy depends on the information supplied by the businesses. Often businesses are charged a fee for "advertising" in the waste-exchange catalogues.

Waste exchange information must be frequently updated to be useful. Increasingly, exchanges are computerized to allow easy updating and access. Florida's Department of Environmental Regulation helps fund the Florida Recycling Marketing System, a toll-free computer bulletin board that businesses can use to advertise for buying or selling recyclable

materials. The Northeast Industrial Waste Exchange publishes a quarterly listing catalog and maintains a computerized database that provides up-to-the-minute information about recyclable materials wanted or available throughout East Coast and Great Lakes states.

Demonstration Projects and Product Testing

To prove the reliability and quality of products made with recyclable materials, many states fund demonstration and "field-testing" programs. Their objective is to provide sufficient information about the performance of a product or process to encourage manufacturers to use it. Minnesota, for example, provides samples of plastic lumber to state agencies to encourage their test use, with the hope that more widespread use will follow. New Jersey and certain plastic businesses fund the Center for Plastic Recycling Research at Rutgers University that researches and demonstrates recycling technologies. The Wisconsin Department of Administration recently tested several brands of recycled copier paper to identify qualified products. Testing involves using the paper in state copy centers and analyzing how well each brand performs on a daily basis. Qualified products may be purchased by state agencies in Wisconsin and Minnesota, which are cooperating on purchases of recycled products.

Demonstration programs are most appropriate for products with potential demand. If the product is too experimental or lacks potential real world application, the demonstration will be meaningless. In addition, results of the demonstration or testing must be widely disseminated to potentially interested parties. Too often, businesses are unaware of potentially valuable information generated in state or federal demonstration and testing programs.

Inclusion of potential users of a technology or product in planning and funding the project helps ensure that results of the demonstration projects are used. For example, Wisconsin met with paper industry representatives before developing its testing program.

Procurement Training

Several states offer workshops for local government and private industry on purchasing recycled products. Similar workshops also could be held with other state agencies. The workshops help purchasers identify what recycled products are available, how to define bid specifications, and how to create bidding procedures that encourage firms producing recycled products to participate. The National Recycling Coalition's (NRC) Business Advisory Council is considering procurement training as part of its effort to get companies to routinely purchase recycled products.

Buy Recycled Promotion Programs

Several states operate public information campaigns to encourage manufacturers to use recovered materials and urge consumers to buy recycled products. Programs range from public-service announcements extolling the virtues of recycling and recycled items to aggressive "buy recycled" promotions. Minnesota's "Buy Recycled" campaign educates purchasers, identifies and tests recycled products, and seeks to buy these products. The state also has developed a "Buy Recycled" logo to increase awareness of the need to purchase recycled products. Seattle's Commercial Waste Reduction Program sends auditors to work with participating businesses to develop buy recycled policies as well as help design office paper-recovery programs. The NRC's

Business Advisory Council, with funding from U.S. EPA, is working with about 28 companies on a buy-recycled campaign. The goal of the effort is to provide information and other support to companies on how to incorporate recycled products into daily business.

School Curricula

Inclusion of recycling information in school curricula can help create a generation of environmentally aware citizens. In particular, such efforts can increase interest in buying recycled products as well as help improve the quantity and quality of recovered materials. New Jersey's Office of Recycling promotes Mr. R.E. Cycle, a magician who appears at schools and children's events. Many state environmental agencies have developed curricula for schools to use to promote recycling.

General Business Assistance and Outreach

All states offer some kind of technical assistance to businesses. State-run programs range from providing very general advice and assistance to targeting specific industries. Michigan's Targeted Industry Program, for example, earmarks resources to promote food processing, forest products, and auto suppliers. Ohio's Technology Transfer Organization is a network of offices that provide free technical assistance, technology information, and training to businesses in the state. North Carolina's Pollution Prevention Program, which is operated by the state environmental agency, works with polluting industries, conducting audits to determine ways of reducing toxic wastes.

The California Integrated Waste Management Board provides financial technical assistance to businesses in California who are seeking financing and who use secondary materials as feedstock. This assistance is designed to find long term low-cost financing for healthy, growing secondary materials businesses in order to promote investment in the emerging secondary materials industry. It focuses on traditional economic development tools to facilitate the development of recycling markets. Examples include a recycling company who is able to refinance short term, high-rate manufacturer equipment loans with a long term, low-rate public loan. Lower cost financing allows the company to reinvest in the industry, rather than in servicing burdensome debt.

The U.S. government also funds a number of assistance programs useful to recycling businesses. For example, the Department of Commerce's International Trade Administration helps U.S. exporters compete more effectively in world markets by providing them with comprehensive information and counseling services. The Small Business Administration's network of several hundred Small Business Development Centers (jointly funded with the states) offers management assistance and finance information to small enterprises and entrepreneurs. In addition, the National Institute of Standards and Technology operates regional centers that provide hands-on technical assistance to small and mid-size firms to improve product quality and modernize operations. The U.S. EPA is currently exploring opportunities to incorporate recycling into these technical assistance and information programs.

Many state and federal technical assistance programs would be valuable to recycling ventures, but entrepreneurs often are unaware of their existence or how to take advantage of the offerings. States need to disseminate information about available programs and how they can

help recycling businesses. Such efforts could involve working with the state's small business development centers to target information to recycling businesses. New York State, for example, has recycling business specialists in local offices of the state economic development agency.

As noted earlier, information and technical assistance programs are relatively low-cost, low-risk means for developing recycling markets. To be effective, information and technical assistance programs must be tailored to the intended audience. To ensure that resources are well spent, state officials should consider exactly which groups they intend to reach; the best means of delivering the information (e.g., publications, data base, hotline); and the frequency of information updates required (e.g., yearly, weekly).

Government Buy-Recycled Programs

Government agencies can direct their purchases of goods and services to help develop certain sectors. For years, they have directed their purchasing practices to specific products such as energy efficient vehicles, types of business owners (e.g., minorities) and in-state business locations.

Now, government agencies are using their purchasing power to enhance markets for recycled products. This trend among states is significant. As of mid-1991, every state had some kind of policy favoring purchases of recycled goods, compared to just 13 states in 1986. While procurement policies usually focus on demand for recycled products, a few states actually buy secondary material to manufacture items themselves. Vermont, for example, purchases recycled aluminum for use in state-produced license plates.

Buy-recycled programs (also referred to as affirmative procurement programs) can lower three barriers to product demand. First, buy-recycled programs can address a lack of information about recycled products' availability, reliability, performance, or specifications. Second, by increasing government demand, buy-recycled improve companies' ability to achieve the economies of scale required for cost-effective production and/or distribution in the private sector. Finally, buy-recycled programs can help overcome procurement officers' oversight of the environmental and natural resource benefits of recycling.

The lack of experience and information about recycled products often has led to obvious as well as subtle biases in government purchasing practices and specifications. For example, government rules specifying the types of products to be purchased may require a particular design (such as requiring paper to be made from virgin fibers) rather than performance standards (paper must run through copiers). Or purchasing officials may require vendors to bid on several products (all paper grades, for example), which may exclude smaller recycling companies that do not make the full range of products. Correcting these problems involves the purchasing agency revising its purchasing specifications and practices periodically to reflect new product information and market conditions.

Moreover, by using and "field-testing" recycled products, government agencies can help to generate information needed to resolve concerns about a product's performance. Innovative products that the private sector considers too experimental or for which government purchases represent a large portion of total sales need this sort of boost.

By including incentives in purchasing programs, government agencies can encourage businesses to establish or expand capacity to produce recycled products. Such expansion translates into demand for more materials and may enable a firm to achieve economies of scale resulting in lower costs and prices for recycled products. Such incentives include material specifications, set-asides, and price preferences that allow the purchase of recycled products even if they are more expensive than virgin products; cooperative purchasing programs that help businesses achieve economies of scale; and guarantees by government agencies to buy a portion of a plant's output. These and other state procurement options are described below.

General Policy Statements

Virtually every state has a policy to purchase recycled products. Some specify the types of products (such as paper or compost) while others may simply urge agencies to purchase recycled products. Such general statements endorsing buy-recycled programs can express state confidence and interest in recycled products.

Material and Bid Specifications

Many states have revised their procurement specifications to eliminate bias against use of recycled products and, in some cases, explicitly require the purchase of recycled products. For example, state law or policy may require that purchasing agents buy specific types of material for certain applications such as recycled paper for all state letterhead. In other cases, purchasing officials have revised practices to allow recycled products to compete more easily for state purchases. Limits on multiproduct bid requests is one way to help small recycling companies that produce few types of products to compete.

New York State has revised its bid specifications to eliminate bias against recycled materials unless necessary for health and safety reasons. New York also mandates that recycled paper be used in state letterhead if the cost is within 10 percent of comparable virgin paper. California requires public agencies to purchase compost and retreaded tires. Wisconsin requires the state highway division to use recycled materials, including compost.

Material and bid specifications for recycled products purchases is the most straightforward approach, signaling government intentions and ensuring that recycled products are purchased regardless of price fluctuations. However, if industries supplying these products are not competitive, material specifications may lead to inflated prices. One way to avoid paying excessive prices is to combine material specifications with price limits. Material specifications are most appropriate for situations in which recycled products have specific uses (recycled paper for letterhead or business cards, asphalt rubber for crack sealant) or for products whose cost-benefit clearly favors the recycled material.

Set-asides

In a set-aside program, a fixed percentage or amount of government purchases of particular products is reserved for those made from recycled materials. That portion is bid separately from virgin-material purchases.

Thirteen states set aside a portion of their purchases for recycled paper and two more have set-asides for all recycled products. The reserved amounts for paper purchases range from 25 percent up to 95 percent. Colorado, South Dakota, Michigan, and California reserve half their paper purchases for recycled paper. Maryland has one of the oldest and most successful buy-recycled programs; it requires that 40 percent of the state's paper purchases contain 80 percent post-consumer material. Maryland and most other states have increased the percentages over time to allow manufacturers to expand their capacity to make recycled products gradually, as well as to provide users time to adjust to the new paper.

Like material specifications, set-asides send a clear message to the marketplace and ensure that some portion of government purchases will include recycled products regardless of price fluctuations. Because the set-aside goal is an exact number, agency officials can measure the progress toward program objectives. However, establishing the most appropriate percentage or amount to set aside can be tricky. The set-aside must be high enough to be meaningful but not too high to cause government agencies to pay inflated prices in meeting the set-aside requirements.

Set-asides can be combined effectively with price preferences to limit the amount paid for recycled products while still stimulating the market. South Carolina, for example, reserves 25 percent of state purchases for recycled products provided the price does not go 7.5 percent over comparable virgin material products. Increasing the set-aside percentage over time allows the industry, purchasing officials, and users to adjust gradually. Set-asides are most appropriate for products for which the industry is partially developed but has not achieved either economies of scale to compete with virgin product producers or does not have the capacity to fulfill all government purchasing requirements.

Price Preferences

To spur demand, 20 states currently allow a price preference for recycled items. Thus, recycled products that cost more than virgin products can still be selected in competitive bidding. These price differentials, which range up to 15 percent, are used most often for paper, with a few applying to rubber-asphalt and metals.

Price preferences often are justified as a way of equalizing recycled with virgin materials, many of which receive tax breaks and other incentives. Moreover, a price preference recognizes the public benefits of recycling—reduced disposal needs and natural resource conservation. While demand for recycled products is growing, manufacturers have not yet achieved the economies of scale enjoyed by virgin-product manufacturers. This is one reason why recycled products remain more expensive.

Price preferences increase the likelihood that governments will purchase large quantities of recycled products and may help persuade manufacturers to expand their capacity. Price preferences indicate strong government interest in buying recycled products while ensuring an upper limit on the amount paid for such items. Price preferences also are often "sunsetted," or offered only for a fixed period of time. This is justified because, in theory, firms producing recycled products should be competitive with those producing virgin products once they achieve economies of scale.

However, sunsetting the price preference ignores some imbalancing price advantages enjoyed by virgin products. Current pricing mechanisms do not incorporate a virgin product's negative environmental and natural resource effects, thereby leading to underpricing. Many virgin products also benefit from federal subsidies such as below-cost timber sales. Price preferences for recycled products acknowledge the social benefits of recycling as well as the need to balance the cost advantages of federal subsidies to virgin products. So long as cost differences exist between recycled and nonrecycled items, an argument can be made to continue price preferences indefinitely to make them more equal.

State experiences with price preferences are varied. A few years ago, states with preference policies reported that recycled products were very competitive with virgin products. In 1988, for example, New York State reported that despite an allowable price preference of 10 percent, recycled paper cost only 2 to 3 percent more than virgin paper. With the general economic slowdown, however, some states are finding that even a 10 percent preference is not enough to cover price differences. Virgin product prices have dropped to 90 percent or less of comparable recycled products in recent months.

In cases where virgin products can be replaced by a variety of recycled products that differ in the type and quantity of recycled content or performance characteristics, price preferences can be used to give an advantage to one of the recycled products. Procurement officials may want to structure the price preference to favor products that meet minimum standards for content or performance. For example, procurement regulations often specify minimum post-consumer content for recycled paper. In a different example, virgin conventional asphalt can be replaced by many other materials, including scrap rubber, rubber-modified asphalt concrete, glassphalt, and recycled asphalt shingles. Some of these products perform better than others and price preferences could favor one recycled product.

Cooperative Purchasing Programs

Local and state agencies can work in concert to issue bids for large, multiagency purchases of certain products, which would allow their manufacturers to achieve effective economies of scale. New York State's Office of General Services, for example, functions as a central purchasing agent for local governments and public authorities. Wisconsin and Minnesota have agreed to a cooperative purchasing program for selected recycled products.

Such programs stimulate manufacturers and save the agencies money through volume purchases. However, getting several agencies to agree to using the same product, especially across state lines, can be difficult.

Guaranteed Purchases

In a guaranteed purchase agreement, a state agency promises to purchase a portion of a firm's production. Guaranteed purchases are most common for military items where the government is the sole consumer. Recently, public officials have explored guaranteed purchase arrangements for recycling businesses. The South Florida Coalition of Counties wants a company to build a new manufacturing facility that would use the counties' plastic wastes. In exchange, the coalition will promise to buy some portion of the finished products, most likely low-demand items such as plastic park benches.

A company receiving a guarantee would be more willing to expand or build a new facility because little or no risk would be involved. Moreover, the guarantee would enable the firm to obtain needed financing. However, the agency offering the guarantee must have assurances that it will not pay an absurd price for the products. Also, the agency must get exemption from rules requiring competitive bidding.

Conclusion

Buy-recycled programs are always a relevant option to overcome uncertain demand, mispricing, or lack of information about a product's reliability. Governments must make purchases; buy-recycled programs represent the deliberate use of this power to achieve desired economic, environmental, and social goals. Moreover, government purchases of durable and nondurable goods are sizable, representing about 10 percent of the total goods made in the U.S. in fiscal 1991. State and local purchases alone came to 4 percent. By directing their purchases strategically and creatively, state governments can have a significant impact on markets.

Each of the policies discussed has its merits and is appropriate in different situations and for different products. Material specifications and set-asides are the most straightforward but can be expensive if little or no competition exists among recycled products. Similarly, guaranteed-purchasing programs lower a company's risk in undertaking an expansion but may prove costly to state agencies if products are not reasonably priced. Material specifications and guaranteed purchases should be targeted to very specific applications.

Unlike material specifications and set-asides, price preferences establish an upper limit on the price agencies will pay for recycled products but may not provide sufficient incentive if the market price exceeds the preference. In instances where several recycled products can serve as substitutes for virgin products, price preferences can provide an advantage to selected recycled products. Finally, cooperative-purchasing programs make sense for items purchased by several agencies or levels of government, so long as they can agree on a common product.

Ultimately, a successful buy-recycled program will depend on the commitment of the procuring agency. Procuring agencies typically have significant latitude in purchase decisions and need to be educated on the merits of buying recycled products. Ideally they should come to view buy-recycled programs as consistent with and even enhancing the agency's overall mission.

Direct Financial Assistance

Direct financial assistance in the form of loans, loan guarantees, and equity is a way for states to help firms create and retain jobs. Almost every state has established agencies or quasi-public authorities to provide such assistance. The reason for such efforts is the fact that capital markets, like other private markets, are imperfect and do not supply needed financing for effective economic development.

Development finance programs address a number of barriers that inhibit the development of markets for recyclables. First, such programs can correct mispricing of finance for recycling projects—mispricing due to investors not accounting for environmental and economic benefits of the project or by inappropriate government subsidies for virgin materials—by offering below-market rates of finance. Second, development finance programs can reduce risk aversion on the

part of investors by making capital available when the private sector will not, by removing private sector risk through providing loan guarantees, and by sharing the risk with private investors through co-investing. Third, development finance programs can address the imperfect flow of information by investing in recycling firms when the private sector has prejudice against such firms because of lack of information. Finally, such programs can absorb or otherwise overcome the high transaction costs of lending to small firms in the recycling field.

States use four types of financial assistance tools to support recyclables market development debt financing, loan guarantees, equity financing, and product/royalty financing. These tools are used through two types of finance programs: general economic development financing programs and programs specifically designed to encourage market development for recyclables.

General State Economic Development Finance Programs

While some states have not designed financing programs specifically for market development of recyclables, their general financing programs support companies using secondary materials. Bond financing, equity financing, royalty financing, and direct loans and guarantees are used most often.

Tax-exempt bond financing historically has been a staple of economic development activities, providing low-cost, long-term financing for a variety of fixed-asset investments by private businesses. However, in recent years federal legislation has cut back on both the amount and use of tax-exempt financing. Environmental projects, including solid waste and recycling facilities, continue to be eligible for tax-exempt financing if carried out by a public entity. Authority to issue private activity tax-exempt bonds expired in June 1992. Such bonds were issued by state and local government on behalf of a private business and were backed by the revenues of the funded project. Some bonds were used to fund recycling businesses. Congress and the Clinton Administration have proposed to reinstitute those private activity bonds.

Over the past decade several states have established *equity-financing funds* to provide high-risk financing to firms. In some states they are run by an independent, quasi-public institution. In others they are operated by private corporations that receive a state tax credit in exchange for their capital investments. Equity financing funds often target investments in certain sectors. Some states require that businesses be in the high-technology field.

A focus on recycling is possible under many of these programs. Indiana requires that its equity-financing institution, the Indiana Corporation for Science and Technology, specifically consider products that create recycled material markets or new products made from recycled materials. In New York, equity financing for business is provided through the Corporation for Innovation Development (CID), which is part of the state's Science and Technology Foundation. CID offers high-risk financing and technical services to technology-based startups and young, growing business ventures.

A number of states fund programs that provide high-risk capital to businesses in the form of *royalty financing* whereby the investor receives a royalty on each product sold in lieu of a loan payback or stock equity. The more products sold, the more return to the investor. Connecticut Innovation, Inc. (CII), the oldest product development corporation in the nation, has begun to

target and support new technologies emerging in Connecticut's environmental industries, including recycling. While activity to date has been slow, CII expects it to grow in the future.

Many states operate business-finance programs that provide *direct loans or loan guarantees* to businesses that create or retain jobs in the state. These programs, which often offer loans at below-market-interest rates, are operated by many states either through quasi-public-development finance institutions or through the state department of economic development. For example, the Virginia Small Business Finance Authority, created in 1984 by the Virginia General Assembly, helps small businesses to obtain short-term capital to improve and expand their operations by guaranteeing a portion of their loans. The maximum guarantee is 50 percent of the amount loaned, or $150,000, whichever is smaller.

Financing Programs for Recycling Market Development

New programs to increase access to capital for businesses for processing or using recycled materials are popular. Finance programs specifically targeted to recycling businesses have been established by a number of the more populous states. The accompanying box profiles several of these programs.

Most programs are usually targeted either to specific stages of the recycling process (e.g., processing) or to specific materials (e.g., scrap tires). California has a new approach that targets financing tools to a specific geographic area. The state works with local governments to designate areas as "recycling market development zones." Within these areas, local governments concentrate and coordinate efforts to ensure that recyclable materials are collected, processed, and used within the zone. The state offers businesses financial incentives (primarily low-cost loans) to locate within the zone or expand existing operations in the zone. State funds also are awarded to the local governments in the zone to finance infrastructure improvements that will directly support businesses that use postconsumer or secondary materials. The advantage of this geographically-focused effort is that transportation costs are cut and the local economy may be boosted. In addition, such concentration of market development efforts raises the public visibility and attention that other financial tools lack.

Source of funds for recycling financial assistance programs comes from direct appropriations, dedicated taxes (e.g., the California Solid Waste Management Board's loan program is financed by a litter tax), or general obligation bonds (Michigan's Solid Waste Alternative Program uses proceeds from the Protecting Michigan's Future Bond issue).

In terms of their goals, financial assistance programs for recycling firms differ somewhat from traditional development finance programs. While traditional economic development objectives are job creation and opportunities for disadvantaged workers and areas, financial assistance programs specifically targeted to recycling industries tend to be concerned about market development.

In contrast to traditional development finance programs, a major failing of financing programs for recycling is that their creators do not analyze capital markets to verify that financing is a barrier to recycling—there is only some vague notion that more capital is needed to promote recycling. As a result, financing programs associated with recycling typically are developed without sufficient understanding of the nature and extent of actual capital gaps. They

often provide deep subsidies in the form-of below-market interest rates when none might be required. In fact, some programs provide grants, when a loan or investment would be adequate to meet the market failure.

In light of these observations, the following guidelines are offered for states contemplating the establishment of new financial assistance programs for recycling businesses:

Commit the minimum public resources necessary to accomplish public objectives. Public resources for economic development and market development are scarce. A state development finance strategy should leverage the maximum amount of private investment using the minimum amount of public investment necessary to accomplish defined public objectives. In designing finance programs, state officials should begin with options involving low public investment and least intervention in private markets. Larger investments and greater market intervention should proceed only if the initial options are considered insufficient to accomplish the desired objective.

One way to minimize program outlays is to establish private-public partnerships. The private financial market is the primary source of financing for the state's businesses, and the resources of private investors and financial institutions will always dwarf those available through the public sector. A successful state development finance strategy will seek to influence private sector business lending to meet publicly-defined objectives through a set of carefully targeted market interventions.

Avoid providing financing to firms that have access to conventional financing at market rates. Rather than fund companies that are able to obtain private financing, public programs should concentrate on firms that cannot obtain financing at any cost.

Examples of Financing Programs for Market Development

Since 1985, the New Jersey Office of Recycling has nun a competitive business recycling loan program with financing of $50,000 to $500,000 available to recycling processors and manufacturers. More is available for businesses working with post-consumer plastics, tires, or low-grade paper recycling mills.

Pennsylvania's Environmental Technology Fund supports recycling market development by making low-cost loans (up to $100,000) to manufacturers and processors to finance purchase of machinery and equipment. The fund is capitalized with state tipping fees. Funding is restricted to companies using or processing materials taken from the municipal waste stream. The fund is administered by the Department of Commerce.

Wisconsin recently passed a law to provide 58.25 million for loans, loan guarantees, and rebates for purchase of recycling equipment by firms that develop local recycling infrastructure.

Michigan's Solid Waste Alternatives Program established several categories for funding market development projects. Both grants and loans are available for three project types: market development research and demonstration, market development, and marketing projects. The program supports the development of structures or equipment that will result in more use of recycled materials in new marketable products or the intermediate processing of materials to supply a new market. Project managers can use up to $10,000 or 10 percent of the financing for promotional programs related to the project.

The Minnesota Office of Waste Management, through its Recycling Market Development Program, offers grants and loans. Private businesses and nonprofit organizations can apply for grants of up to 25 percent of eligible project costs up to $500,000, or for loans of up to 50 percent of eligible project costs up to $2 million. Eligible projects must create new or expand existing manufacturing capacity that uses recyclable materials or provides end-markets for Minnesota's recycling program.

The Indiana Recycling Promotion and Assistance Fund was created to promote market development by providing loans for establishing or expanding existing recycling businesses or retrofitting manufacturing operations to process secondary materials. The loans are available for the acquisition and installation of recycling equipment. The program is administered by the Indiana Department of Commerce's Office of Energy Policy.

Rely as much as possible on existing public sector finance institutions before creating new ones. Existing programs and institutions have already developed a level of capacity and expertise that can often be built upon rather than replaced. New programs may simply duplicate existing efforts and confuse businesses. The issue is particularly relevant to recycling market development activities. Rather than develop new programs in environmental agencies, for example, which have limited experience in financing business, states should look at modifying existing finance institutions (such as the state department of economic development) to target recycling businesses.

Staff public programs that provide financing to business with professionals skilled and experienced in the business lending process. The key to a successful program is the quality of the staff. Business lending is a very specialized area that requires individuals with direct experience in analyzing and packaging deals, monitoring borrowers, and providing borrowers with appropriate assistance.

Target development finance efforts effectively to meet identified gaps. To ensure public funds are well spent, finance programs should address a specific, identified financing gap (by type of firm, type of financing tool, or region). Addressing financing gaps does not mean assisting firms that are not financially viable. Rather, it means assisting firms that: 1) can afford the market cost of capital, but do not fit the investment preferences of existing private financial institutions; or 2) cannot afford the market cost of capital, but merit public investment on the grounds that they will serve an important public purpose, such as job creation or community revitalization.

Decentralize the direct provision of financing assistance for smaller enterprises. Smaller firms often require intensive hands-on assistance and, because of their small size, may find it difficult to deal with large-scale, distant lending institutions operated on the state level. Moreover, economic and market differences among regions of the state require a decentralized program. Consequently, state policy should rely on regional and local organizations to provide assistance.

Coordinate development finance services with other business assistance services. Obtaining financing is only part of the business formation and expansion process. Financial assistance must be coordinated with other forms of assistance, including entrepreneurship training, management counseling, technology deployment, and job training services.

Grants

Grant programs to encourage market development for recycling take two primary forms. Many states give grants to local jurisdictions to support program planning, promotion, and education efforts and to improve supply reliability. These grants are meant to overcome barriers related to information flow, transaction costs, and the easy accessibility to research results. For example, high marketing costs in certain communities hamper access to markets for collected materials. Grant funds compensate for those additional costs.

Many states also make grants to nonprofit organizations, educational institutions, and private businesses to support research and development activities on technologies for processing of secondary materials and the development of new products. These grants are used to help make proprietary information available to all and cut investors' risk. Private enterprises are often unwilling to invest in new recycling technologies because the benefits of their research could be shared by their competitors. Moreover, companies have more incentive to make large investments in new products or technologies with very uncertain payoffs. The risk of using secondary materials is often higher than the potential level of private return justifies. In these cases, direct subsidies through a governmental grant is an incentive for private enterprises or other institutions to undertake R&D activities that meet the specific public objectives. Several state programs are profiled in the accompanying box.

States can use grants primarily to support early-stage R&D and feasibility studies that are difficult to finance through the conventional markets, have uncertain returns, and produce non-proprietary information. Because feasibility studies and research and development activities are speculative in nature, they can provide greater benefits to the public in dissemination of information on waste solutions than immediate financial benefits to a particular firm. If the state wants to support proprietary research that benefits only one firm, the financial support should be

structured as an investment, not a grant. Grants are particularly appropriate to support activities the grantee would not undertake with a loan or equity financing.

Examples of State Research and Development Grant Programs

The Environmental Technology Research and Development Fund in Pennsylvania stimulates the growth of markets for recycled goods by providing grants for research and development and technology transfer activities. Since 1989, the Fund has awarded nearly $1.4 million to a variety of private firms, educational institutions, nonprofit resource institutions, and consortia of businesses and educational institutions. The Fund received a new grant to support the use of recycled materials for transportation and related needs in 1992. The state expects to make ten awards totaling $150,000 for transportation ROD projects. The Ben Franklin Partnership solicits and processes grant applications to the Fund on behalf of the Departments of Environmental Resources and Transportation. The Fund is overseen by a special board.

The Office of Waste Management in Minnesota has a Directed Research and Feasibility Grant Program to support research activities that lead to increased demand for and use of recyclable materials and recycled products. Research institutions and private organizations are eligible for grants up to $100,000 for initiatives that support regional, state, or county market development efforts. Eligible projects include gathering performance data on recycled products, researching products that use recyclable materials, and conducting feasibility studies on manufacturing capacity to use recyclable materials.

The county grant program in Minnesota allows counties to apply for funds for private-sector projects for amounts up to $100,000 or 25 percent of the capital costs. Projects are eligible that expand local manufacturing capacity to use recycled materials, develop processes that add value to materials to improve their marketability, develop cooperative or regional marketing programs, implement practices to purchase recycled products, or develop and implement methods to efficiently transport recyclable materials to intermediate and end-markets.

The Office of Recycling Market Development in New York has a grant program to support research activities to develop technologies or products that enhance demand or improve the supply of recyclables. From 1989 through early 1992, it awarded over $1.3 million for nearly 30 R&D grants. The office has used the fund to target certain materials in past funding cycles, such as office waste, old newsprint, and tires.

Taxes and Fees

The tax and fee system is used by state government to provide financial incentives and disincentives that alter the behavior of market participants by changing the economic returns of market transactions. The goal is to encourage the market to consider public benefits and costs in its investment, pricing, and buying decisions. Specific taxes are imposed to increase the costs of certain actions, thereby providing a disincentive for these actions. Tax credits, abatements, and deductions are tax incentives that lower the costs of specified activities.

Taxes

By raising the cost through the imposition of a tax or fee, the tax system can discourage activities that impose a cost on society not borne by the individual producer. The tax or fee can be placed on certain materials such as virgin materials, or on certain activities such as trash collection or disposal. For example, as an alternative to requiring local newspapers to use a certain percentage of recycled newsprint, some states are considering a tax on virgin newsprint as an incentive for use of recycled paper.

Taxes can be aimed at encouraging end-users to buy recycled. By imposing a tax or fee on virgin materials, the state is in effect forcing the market to consider the costs to society in the use of a specific material. If the cost of virgin materials were raised relative to secondary materials, consumers (whether businesses or individuals) would have an added incentive to use recycled products. Such a system could be burdensome to administer. Moreover, it could affect the competitive position of the state relative to others.

Tax Incentives

By lowering the cost of specified goods and services, the tax system can address the mispricing of secondary materials and recycled products due to the undervaluation of public benefits. In the state budgeting process, tax incentives are known as tax expenditures. Although a tax incentive does not involve direct payment to the firm by government, tax revenues fall as if the government did make such payment. While tax incentives have the same fiscal impact as an expenditure of funds, they often are perceived as a more politically acceptable method of influencing private behavior. Credits or incentives providing some manner of tax relief take a variety of forms: sales tax exemptions for new equipment or raw materials used in production; investment tax credits for purchases of productive fixed assets; employment income tax credits based on a proportion of new wages and salaries; property tax exemptions for locating in a specific area or making a particular type of investment; and credits for investments in research and development activity. These options are reviewed below.

Investment tax credits are the most common financial incentive employed by states. Some states have general investment tax credits for all industry, while others narrow the focus to firms collecting or processing secondary materials. An investment tax credit provides businesses with a credit against their corporate income taxes for investments in specified activities. Recycling investment tax credits often have two purposes. First, they encourage businesses to use more recycled materials. Second, tax credits may attract large companies to the state.

States consider several issues in designing tax credit programs. Some allow any type of activity to qualify, while others limit credits to investments related to specific problem wastes. For example, Colorado chose to make credits available for investment in plastics recycling technology, while Maryland chose to credit all expenses related to converting furnaces to burn used oil. Some states specify the level of post-consumer recycled content required to qualify for a credit—25 percent in Colorado and 50 percent in New Jersey.

Other states target credits specifically to investments in processing equipment, or more generally to any activity that increases use of secondary materials. Oregon has the longest standing tax credits for market development. For more than ten years, two state agencies have awarded credits. The Department of Energy provides a 35 percent investment tax credit over five years to businesses that install renewable-resource equipment. Waste recycling projects qualify. The Department of Environmental Quality (DEQ) offers a 50 percent credit over ten years against taxes for capital investment in new facilities that prevent, control, or reduce pollution, including recycling.

California recently created a 40 percent tax credit of up to $250,000 spread out over three years for investments in recycling equipment. This equipment must be used for processing materials at least 50 percent secondary and at least 10 percent post-consumer. New Jersey offers

a 50 percent investment tax credit on the purchase of transportation and processing equipment or equipment used in the manufacture of products containing at least 50 percent post-consumer recycled content. In 1990, 327 applications were certified for $28.6 million in credits.

Sales and property tax exemptions for recycling activities are offered by a number of states. Illinois, New Jersey, and Wisconsin offer sales tax exemptions on waste reduction and recycling machinery purchases. Some states offer business property tax exemptions to encourage the location of recycling industries. These statutes in effect allow local taxing districts to provide tax abatements for specified activities related to recycling. Indiana provides a 95 percent property tax exemption for buildings and equipment involved in converting waste into new products.

A consumption credit provides credits to manufacturers or consumers using secondary materials or recycled products. Proposed legislation in Massachusetts would make businesses eligible for a 10 percent tax credit against the cost of purchasing recycled materials to substitute for the raw materials they now purchase.

Wisconsin has two rebate programs. The Qualified Property Rebate Program provides companies with a 5 to 10 percent rebate on the purchase price of machinery and equipment used exclusively for making products from secondary materials. At least 50 percent of the recyclables must be generated in the state. The General Rebate Program provides financial assistance to companies that make products using post-consumer recyclables.

The use of tax incentives to achieve public benefits has been very controversial. Proponents argue that they are a low-cost means of affecting private investment decisions. Because states often see themselves in competition with one another, incentives often are viewed as necessary to match the incentives provided by other states. Opponents of tax incentives characterize them as ineffective. They argue that incentives do not generally change the behavior or investment decisions of businesses but merely provide the firms with a windfall for actions they would have taken anyway. Opponents also point out that state and local taxes are a relatively small proportion of the cost of doing business and, therefore, less important than other factors such as access to markets, availability of skilled labor, and provision of public services.

Several recent studies indicate that sales, property, and investment tax credits have not been particularly effective tools for promoting market development. Franklin Associates, Feasibility of Tax Incentives for Purchases of Recycling Equipment or Recycled Products; Resource Conservation Consultants, Pennsylvania Recyclable Materials Market Development Study. The findings of these studies are in keeping with evaluations of the effect of tax incentives on economic development—tax incentives are not effective as economic development tools. See, for example, Mt. Auburn Associates, The Role of Taxation in State Business Climate, prepared for the Corporation for Enterprise Development.

For several reasons, direct financial assistance is generally preferable to tax incentives. First, loans are less costly to the state—they are paid back. Second, loans rely more on market mechanisms—negotiating case by case—than do tax incentives, which are an entitlement. Third, the case-by-case approach means that direct financial assistance is generally preferable to tax incentives because of the greater ability to target resources and benefits. Perhaps the only rationale for a business tax incentive program is if a state could award the credits selectively and thereby use the credit as one of a series of incentives in a package to assist a firm.

Regulation

Regulation is used by all levels of government federal, state, and local—to influence private sector decisions. Restrictions are imposed on a wide range of businesses and business activity, usually when profit considerations cause actions that can impact public health and welfare or in situations where the market response is unbalanced or not timely. However, because it is a major intrusion in the market with the potential for significant disruption, regulation is used conservatively.

Most existing regulatory activity on recycled products focuses on the recovery, rather than use, of recyclable materials. For example, regulations cover mandatory separation of recyclables and disposal bans. In the last two years, as supplies of recyclables have increased, a handful of states have set regulations to boost demand for recyclable materials and recycled products. In general, they are of two types: product labeling standards by which any manufacturer wishing to use certain terms, like "recycled," on a product must conform to certain content standards; and utilization requirements, by which products of a certain type in a state must have a specified minimum content of recycled material.

Product Labeling

By providing accurate information, state labeling programs can channel consumer demand for products with the highest recycled content and thereby encourage manufacturers to use more recycled materials. Too often, consumers receive no or misleading information about a product's environmental benefits. In fact, concerns about deceptive environmental claims have lead to investigations by the Federal Trade Commission. Several states, including Rhode Island, New York, and California, have passed laws to restrict the use of recycling labels. Typically, these laws require state agencies to set standards for the use of terms such as "recycled content," "recyclable," "degradable," and "compostable." Any company wanting to use those terms in product marketing must certify to the state that the product meets those standards.

The actual impact of these regulations on recycling markets is not clear. Rhode Island's regulations, effective in 1990, were the first. In fact, the effect of labeling regulations will depend on how much of the regulated product is sold in the state. While a national or international firm may stop selling nonconforming products in states that represent a small share of overall sales, it might modify production to continue selling in large states or multistate regions with such requirements or it might modify labeling practices. For these reasons, Rhode Island has coordinated its regulations with other northeastern states with similar labeling laws. At the urging of states and many companies, the Federal Trade Commission, working with EPA, recently issued nationwide voluntary labeling guidelines. Even so, as the laws do not require recycled content, only conformance to the law if labeled "recycled," the ultimate verdict on the effectiveness of these laws depends very much on continued consumer interest in recycling.

Utilization Requirements

To increase demand, states can mandate that certain products contain a specified minimum percentage of recycled material. Some require businesses to use a minimum percentage of recycled material. In adopting utilization regulations, states seek to spur manufacturers to more rapidly expand their capacity to use recyclable materials.

By the end of 1991, nine states—Arizona, California, Connecticut, Illinois, Maryland, Missouri, Oregon, Rhode Island, Wisconsin, and the District of Columbia—had laws mandating that newspaper publishers use a minimum amount of recycled newsprint. Connecticut has one of the oldest recycled newsprint utilization laws, passed in 1989, that imposes requirements on producers and users of newsprint. Both must meet an 11 percent utilization rate by 1992.

While utilization requirements have focused primarily on newsprint, some states have regulated other products as well. California mandates that by January 1993, sellers of plastic trash bags must ensure that each bag contains at least 10 percent recycled post-consumer material. In 1995 the requirements mandate 30 percent recycled content and expand to include trash bags of .75-mil thickness. Manufacturers of rigid plastic containers sold in Oregon must ensure that the container contains 25 percent recycled material; is made of plastic recycled at a 25 percent rate in Oregon; or is reused at least five times for a substantially similar use.

Utilization requirements are fairly new; the earliest effective date is January 1991, so experience with implementation is very limited. Virtually all of the laws try to ease the transition by increasing the requirements gradually. Most newsprint requirements provide exemptions if the recycled material is not available in a reasonable period of time, at a comparable price to virgin newsprint, or does not meet quality standards. All states except Oregon have penalties for noncompliance or for reporting false information to the designated state agency.

Like any regulation, utilization requirements are meaningless unless they are understandable, physically achievable, and enforceable. Such requirements are best suited to situations where the industry is capable of using more recycled material but would otherwise make the transition more slowly than possible or desirable to achieve the environmental or economic goals. Requirements for recycled content are possible only if the recycled material and production technology are available. At the same time, utilization requirements, like many environmental regulations, often are intended to be "technology-forcing": they seek to push development of new technologies and practices.

Determining the correct required utilization level can be difficult. It should not be so high as to be infeasible. If set too low, however, the requirements may have little or no impact on market development. Some states may phase-in the requirements to ease transition while still pushing the increased use of recycled products and materials. They may use other means, such as financial incentives, to ease the transition.

State officials working on utilization requirements report that enforcement is easier for relatively homogeneous products (e.g., glass and metals). Those produced largely for statewide rather than national markets (e.g., bottles, newspapers, telephone directories) and for which there are few producers are most successful.

Rather than directly regulating content, 12 states have worked with businesses to develop voluntary agreements to meet utilization goals within a specified time. Such agreements are preferable to regulations that require enforcement. However, those states with voluntary agreements have used the threat of regulation to spur industry changes. The most effective, and least costly, approach may be to seek voluntary agreements backed up with regulations if the agreements are not met within a specified time. If a voluntary agreement is not possible,

decision-makers also can consider, as an alternative to utilization requirements, creating a tax disincentive to buy virgin.

Summary

A brief summary of our major conclusions regarding each type of tool follows:

- Information/technical assistance is a low-cost, unintrusive tool that can be used in a number of ways to make markets more efficient, particularly in situations of imperfect information flow and uncertainty.

- Buy-recycled programs capitalize on the government's purchasing power and do not require intervention in the marketplace. It is most worthwhile when government buys a significant amount of the recycled product.

- Direct finance assistance programs can address problems of high transaction costs, and aversion to risk.

- Business tax incentives can address causes of market failure, but can be seen as entitlements. Studies have shown that direct finance programs are more effective tools. Perhaps the only rationale for a business tax incentive program is if a state could award the credits selectively and thereby use the credit as one of a series of incentives in a package to assist a firm.

- Grants are used primarily to support the types of activities—research and development and feasibility studies—that are extremely difficult to finance through the conventional market, that have very uncertain returns, or that are inhibited because the results of such research and study are easily accessible to the public.

- Regulation will work only when requirements of the law are understandable, achievable by businesses, and enforceable by the government. Because it is a major intrusion in the market, regulation is generally used conservatively. To provide for responsible product labeling, governments are attempting both voluntary and regulatory approaches. Utilization requirements can be used when the change in behavior must be implemented across an entire class of product buyers.

4. Choosing Market Development Tools

State officials with the responsibility for a recycling market development program must select the best tools to overcome the identified barriers. Experience to date suggests three principles for market development policy. After a review of these principles, this chapter examines three steps officials can take in choosing market-development tools. Finally, suggestions for evaluating programs are due.

General Principles for Market Development Policy

Policies that promote recycling and market development should follow the hierarchy of solid waste management alternatives. In general, state solid waste policy should stress conservation of natural and human-made resources through effective waste-reduction practices and the efficient recovery of waste materials and their remanufacture into finished products with recycled content. Recycling policies and programs should be integrated into the broad array of solid waste policies.

ln efforts to encourage firms to use recyclable materials or products, states should rely on private markets as much as possible and pursue the least intrusive policies to overcome market failure. Well-functioning markets are needed if recycling is to work. Government's role is to help markets function better, not to constrain them. Consequently, government intervention in the marketplace should take place at the lowest level needed to deal with the source of market failure. For example, if markets can be assisted by information and technical assistance alone, greater intrusion may be counterproductive. Also, the least intrusive usually has the virtue of costing less.

Policymakers may have to use a unique set of tools for each secondary material. Because of differences in market characteristics, the sources of market failure and the points of leverage for government action vary from material to material.

Selecting Market Development Tools

There is no simple recipe for choosing market development tools. Fashioning a series of effective market-development initiatives requires a thorough understanding of the dynamics, institutions, and participants in the secondary-materials market, as well as an understanding of available policy options and their relative effectiveness. It also requires a high degree of creativity. Key steps to choosing market development tools are reviewed below.

Identify Priority Materials and End-uses

Because some secondary materials are more problematic than others and government resources are scarce, policy analysts need to identify which secondary materials should receive priority attention. The choice should be influenced by the current and prospective disparity between supply and demand for each material and the effect the disparity for each material will have on the environment. It should be noted that a small amount of hazardous waste may present

more concern than a large amount of clean, relatively inert waste. To be prepared to address gluts in supply, many states intelligently started their market-development efforts in earnest months and years before recycling laws became effective. Once the laws are in effect, officials need to understand both what the situation is now and what it is likely to be in the future and adjust their priorities accordingly.

For each priority material, state officials must then determine the priority end-uses. Most secondary materials can have several end-uses. Budget constraints probably will influence the end markets promoted. Policymakers might consider the six criteria discussed below in their choices:

Extent to which the need for raw materials is displaced. Policy should prefer remanufacture of secondary materials in their original form, for example, old newspaper (ONP) turned to recycled newsprint and used motor oil turned into recycled motor oil. Such a "closed loop" allows for multiple reuses, which spare large amounts of virgin materials.

Some materials do not as easily allow for multiple reuse, but do replace some original raw material. For example, ONP used in recycled boxboard and gypsum linerboard displaces the need for some virgin wood fiber. However, because these end-uses are not themselves recycled at present, they are second-tier preferences.

End-uses that neither easily allow further recycling nor displace the need for the original raw material are the lowest priority. Animal bedding made from ONP or asphalt with crushed glass as aggregate are examples. In these cases, neither virgin wood fiber, sand, nor silicon are saved; however, straw and gravel are.

Level of value-added. Policy should promote those end-uses that pay the most for the secondary material. Higher value-added means greater returns to municipalities. It also tends to mean better paying jobs for those working with the material.

End-uses that pay best are those closest to their original form. The purity of secondary materials—cleanliness and separation from unlike materials—determines how much value can be added. For instance, a ton of mixed office paper will fetch a far lower price than a ton separated into types of paper—non-laser-printed white ledger, laser-printed white ledger, colored ledger, newspapers, corrugated containers, or magazines. The same is true for mixed versus separated plastics. Obtaining higher prices means promoting separation and cleanliness as well as targeting the markets that can use the clean, separated material.

Long-term market stability. Market-development policy should target end-use markets that appear to be stable over the long term. For example, North American wastepaper markets are more stable than overseas markets.

Potential for market expansion. Market development policy should seek to promote end-uses that can show growth over time. For example, the potential growth in the market for ONP in recycled newsprint is far greater than that for ONP in hydro seeding.

Market diversity. Reliance on any single end-use market is dangerous. Demand by one end-use for a secondary material can be curtailed by any number of factors, including drops in

the price of the virgin material, economic recession, and a rise in value of the dollar (which makes our exports of secondary material more costly). Hence, to protect against such vulnerability, market development policy must seek diversity of end-use markets to the extent possible.

Economic development potential. In choosing which materials and uses to target, state officials should seek to maximize the number of jobs created and retained. Job creation occurs through recycling business development and expansion. Job retention occurs through achieving lower costs (e.g., replacing virgin materials with secondary materials) and greater productivity (e.g., more efficient recycling equipment).

Identify Key Sources of Market Failure

For each priority material and end use, decision-makers can identify the participants and behavior which advertently or inadvertently, are blocking market development and the causes of market failure. AS noted in Chapter 2, causes of market failure or set of failures can vary greatly from material to material, and it is helpful to tailor the mix of market development tools for each material.

Choose Market Development Tools

Once priority materials and causes of market failure are identified, state officials can determine which policy and program tools are most appropriate to address the failures. They should consider the type of stimulus that would motivate those associated with market barriers to change their behavior and the tools available to government to provide that stimulus. Table 4.1, a matrix of market development tools by causes of market failure, is designed to assist in that process.

Officials can then decide which of the policy or program options available is most effective in overcoming the causes of failure. Factors to consider are:

- effectiveness in removing source of market failure and increasing market efficiency;
- cost-effectiveness;
- feasibility in terms of legislative enactment;
- feasibility and cost of implementation;
- flexibility in the face of change;
- equitable distribution of economic effect; and
- public understanding and acceptance.

The options are not limited nor mutually exclusive. For each material, policymakers need a set of tools that complement each other. Also, while each material requires a unique set of tools

to stimulate markets, officials may be able to identify similar issues across materials and build programs that achieve some economies of scale and knowledge.

The set of market development programs will vary from state to state. Differences in the nature of markets, priority materials, recycling infrastructure, existing capacity and structure of state government, and the role of local government all lead to different problems and different solutions.

The wide array of market barriers and the states' lack of experience in market development means that new solutions must be developed constantly. The analysis of markets and policy should not be static; state officials must update their analysis continually to ensure that resources are directed to the most relevant feature of recycling and market-development processes.

Evaluate Impact and Adjust Strategy and Tools

Evaluation should be an integral part of any state market-development strategy. Effective evaluation will reveal whether a strategy, policy, or program achieves its desired goals. Decision-makers then have the opportunity to update or redirect policy and programs. Evaluations also are a useful way to communicate with constituent groups—public, private, or nonprofit interests.

State officials should evaluate programs for appropriateness, effectiveness, and operations and management. These three types of evaluation can be done together or separately. A program is appropriate if a logical connection between the problem and the solution continues to exist. This analysis requires that policymakers review current barriers to market development and revisit the analysis that yielded the chosen tools. Operation and management evaluation considers the means used to implement the program, such as personnel and financial management and strategic planning. The remainder of this section focuses on effectiveness evaluation.

State officials can evaluate program effectiveness on two levels. The first level is the extent to which the policy or program removed or reduced the target market barrier. For example, if participants lacked information, the program should have provided it. If producers lacked capital, the program should have increased access to that resource.

Examples of Market Development Tools by Causes of Market Failure

Cause	Information and Technical Assistance	Buy-Recycled	Direct Finance	Grants	Taxes and Fees	Regulation
Imperfect Flow of Information	Market Data Recycling Directories Waste Exchanges Business Outreach Procurement Training	Policy Statement Set-asides Guaranteed Purchases Cooperative Purchasing Bid & Material Specs Price Preferences	Loans and Loan Guarantees Bond Financing Equity Financing Royalty Financing	Local Government Grants		Product Labeling
Uncertainty About Future Markets	Market Studies/Projections Demonstration Projects Testing	Set-asides Guaranteed Purchases Cooperative Purchasing	Loans and Loan Guarantees Bond Financing Equity Financing Royalty Financing			Utilization Requirements
Undervaluing Public Benefits and Costs	Outreach Education	Bid & Material Specs Price Preferences	Low Interest Loans All Below	Local Government Grants	Tax Credits Tax Exemptions Rebates Tax on Virgin	Utilization Requirements Voluntary Agreements
High Transaction Costs	Market Data Recycling Directories Waste Exchanges		Loan Programs Equity Programs Royalty Financing	Local Government Grants		
Initial Small Market for Recycled Products	Recycled Products Directory	Set-asides Guaranteed Purchases Cooperative Purchasing				Voluntary Agreements
Aversion to Risk			Loan and Loan Guarantees Bond Financing Equity Financing Royalty Financing			
Unrestricted Nature of Information				Research Grants		

However, reducing a barrier is simply an "intermediate" impact. The second, higher, level of impact is the extent to which markets develop, the environment improves, and the economy benefits in the process. Specific measures of market development might be tons of secondary materials processed, value of shipments of recycled products, market share held by recycled products, and attitudes toward using recycled products. Desirable environmental effects might be lower amounts of virgin materials extracted or the level of pollution curtailed. The economic benefits can be measured by jobs created and retained, wages generated, or improvements in productivity or competitiveness .

Evaluators like quantitative measures—tons processed or jobs created—because they can tell a clear story quickly, if used appropriately. However, the impacts of many programs either are hard to quantify, or the data are not collected. Consequently, qualitative analysis as a means of measurement should not be ignored. Surveys and case study method can add detail to policy evaluations. The market-development effects of most policies and programs are multiple, often indirect, and interrelated. Surveys and case studies can tease out these details. For example, tracing the market-development impacts of a research grant program is difficult to do purely quantitatively, but interviews with researchers, industry representatives, and equipment manufacturers can add significant amounts of information.

Moreover, while quantitative analysis can do little to explain why impacts occurred, qualitative analysis can illuminate people's motives. Knowing why behavior changed or did not change gives policymakers a basis for adjusting program operations. The best evaluations combine quantitative analysis for variables easily and clearly measurable with qualitative analysis. Surveys can combine the best of both by measuring people's perceptions of the impacts of a policy.

In the evaluation process, evaluators must take care to address the issue of attribution—the extent to which a clear causal link can be seen between the program and the outcomes. Attribution often is difficult to discern for several reasons. Often the effect of state programs is dwarfed by broader economic forces or federal programs. Also, particularly for tax credit and finance programs, care must be taken to determine whether a business would have carried out the same action in the absence of the state incentive.

The existence of several programs with overlapping goals may cloud the determinations of effectiveness. For example, the concurrent existence of a ban on yard-waste disposal, technical assistance to local communities for composting, a permitting program for compost piles, and compost procurement program will make it difficult for officials to evaluate the effect of each program. Some types of policy tools and programs are inherently difficult for determining cause and effect. For instance, general information and technical assistance programs are amorphous.

In general, qualitative analysis—surveys and interviews—is perhaps the best way to deal with attribution issues. Talking to people about why they do what they do usually allows policymakers to draw the causal connections they need to make good policy.

To facilitate effectiveness evaluation, data collection is important early in program development. Data collection should be part of the program at key points of interaction with the target population—at point of application, at point of service, and during regular monitoring. For detailed evaluations, evaluators may need additional surveys, interviews, and review of firms'

records. In planning a new or modified program, officials need to think through how its effectiveness will be measured and what information will be needed, and make plans at the outset for collecting needed data.

The Long-term View

Market development is a short-term response to an unusual situation—the massive increase in the availability of secondary materials generated by recycling programs. Much market development is underway, and this guide is intended to speed the adjustment process.

The long-term challenge, which most market-development people already know, is to manage all materials—virgin and secondary—to minimize solid waste, conserve scarce resources, and maximize the economic development impact of this process. Recycling and market development are part of a larger array of federal, state, and local policies, programs, and practices dealing with this nation's materials. Actions to develop markets for recyclables can be designed with full awareness of the solid waste, economic development, and materials context within which these actions are to take place.

5. Organizing for Market Development

States can organize themselves for market development for recyclable materials in various ways. They can identify which agencies participate in and are responsible for market development; which existing programs are useful and which new ones to create; and how to fund market development activities.

Responsibility for and Participation in Market Development

Market development is often complicated by organizational and logistical factors. The expertise needed is found among different state agencies. Moreover, local jurisdictions and a broad range of private-sector organizations also are involved. Program managers have to make these disparate elements work together. In addition, materials markets often cross state boundaries, calling for multistate approaches. Regional efforts, however, are quite difficult to organize.

As states initiate or review market-development programs to support their recycling efforts, they must settle these issues early on. One state agency should have principal responsibility for market development—the environmental agency, the economic development agency, or a new agency. Coordination of the activities of different state agencies around market development is a crucial component and must have high-level support to keep agencies' turf problems to a minimum. The best way to involve local communities and the private sector must be found. And the prospect for states working together on market development activities depends on developing cooperation on common fronts.

Management at the State Level

Market development for recycling requires the unique coordination of two distinct "cultures"—environmental protection and economic development. Environmental agency staff are familiar with many of the recycling and market development issues; they have expertise in environmental regulation, education, and solid-waste planning. They have experience working with local jurisdictions on solid-waste management issues and knowledge of the participants in the recycling market, particularly on the supply side.

However, as market development activities have expanded at the state level, economic development departments often are brought into the process for two reasons. First, the experience and skills of economic development professionals often match the skills needed for effective market development activities. Because the role of the economic development agency is to encourage business investment, its skills are helpful in influencing the business decisions. Economic development professionals deal in the business environment daily; they have experience working in partnership with the private sector. The skills they have developed to meet their primary goal, job creation, often coincide with those needed to develop recycling markets. Second, the goals of market development, while promoting greater use of secondary materials, have important secondary goals related to the economy. Market development activities can help

create and retain jobs by encouraging new enterprises, increasing the competitiveness of existing enterprises, or attracting new companies to the state.

Examples of Lead Agency Options

Environmental Agencies

The Minnesota Office of Waste Management (OWM) created the Recycling Market Development Program in 1987. The state legislature expanded its market development efforts in 1990. OWM was then designated the lead agency for market development. The recycling program is staffed by four full-time professionals. It functions as a partnership between businesses and the local and state governments. As part of its overall strategy, OWM administers three financial-assistance programs, provides technical assistance, runs promotional campaigns, and supports a transportation network serving markets for recycled goods and materials. OWM created the Market Development Coordinating Council to coordinate efforts among various state agendas, local goverment, recycling businesses, and private industry.

Economic Development Agencies

In New York, primary responsibility for market development activities is given by statute to the Office of Recycling Market Development (ORMD) in the Department of Economic Development (DED). Since 1988, a staff of 14 has been actively providing financial and technical assistance services at the state and local levels to public and private organizations. It offers loan and grant programs, provides market research and information, conducts promotional campaigns ("buy recycled"), and drafts policy on recycling. ORMD staff meet regularly with other DED staff and other state agencies with a stake in recycling. These include the Department of Environmental Conservation, which is responsible for regulating solid waste management; the Solid Waste Management Board, a public-private group that provides advice to state agendas on solid waste and market development policies and programs; and the Legislative Commission on Solid Waste Management, which advises the legislature on solid waste management policy and provides oversight on existing policies and programs. The ORMD also coordinates the activities of other state agendas relating to secondary-materials market development through an interagency working group.

Interagency Group

In Pennsylvania, the responsibilities for implementing various aspects are divided among several existing state agendas. The governor established a cabinet-level task force to oversee Pennsylvania's market development program. The task force is chaired by the lieutenant governor, and includes the secretaries of environmental resources, commerce, transportation, community affairs, education, agriculture, general services, and the director of the energy office. Its charge is to establish annual short- and long-term goals for the state market development effort, evaluate the state's success toward meeting these goals, and develop federal and regional recycling-market development approaches.

New Entity

In 1991, Washington State established the Clean Washington Center as a division of the Department of Trade and Economic Development to oversee the development of policies and programs for developing markets for recycled goods. The Center's board of directors includes representatives from the legislature, municipal goverment, and private industry. The Center's mission is to bring market development efforts under one roof, including research and development, new product/technology transfer, recycling business assistance, and the recycling information clearinghouse. The Center advises the legislature and state goverment on policy changes to help overcome market barriers for recycling and address long-term materials policy, including packaging design and content, substituting recycled materials for virgin materials, and overcoming bottlenecks in collection or processing. The Center has until June 30, 1997 to reach its goals, after which it will cease to exist unless the legislature takes action to extend the mandate.

Market development activities should be closely coordinated with other state agencies as well. As noted, state purchasing agencies have the ability to expand markets for certain recycled products by using the states' purchasing power. The transportation or public works agency often plays a critical role in market development for recyclables used in roadway construction. The lead agency for recycling markets needs to build a good relationship with these and other agencies to integrate recycling with their overall mission as appropriate.

The organization of market development activities in Minnesota provides insight into the full range of state agencies that can be involved. The Office of Waste Management is the lead agency, responsible for implementing financing programs and providing overall technical assistance to all involved in recycling. The Department of Administration is the lead agency in the recycled-products procurement program. The Minnesota Pollution Control Agency collects data in permitting, studies waste composition, administers grant and loan programs for waste tires, and enforces battery regulations. Product testing, procurement, and specifications setting go through the Department of Transportation. The Department of Trade and Economic Development is involved indirectly with its strong community development orientation. The Office of the Attorney General develops labeling and standards for recycling materials. A multiagency Market Development Coordinating Council coordinates these efforts.

States have developed a range of creative approaches in structuring the involvement of the various agencies. In general, states have conferred responsibility for managing market development activities on one of four agencies: the environmental agency, the economic development agency, an interagency cooperation council, or a new agency specifically for that purpose. The accompanying box describes examples of the four approaches.

Decisions on how to distribute the various responsibilities of market development depend upon the option chosen. For example, if the state's focus of the market development activity is on technical assistance and financial assistance to private businesses, the economic development agency might be the appropriate lead agency. If the state's focus is regulatory or very decentralized with a lot of interaction with local communities, the environmental agency might be an appropriate lead. However, it can be difficult for a regulatory agency to build the kind of private-sector relationship needed for market development. If the state is taking a comprehensive approach to market development policy, including all appropriate tools, it should consider setting up a specially designed public or quasi-public institution to take lead responsibility. Whichever approach is taken, some level of interagency cooperation is required. Whether this cooperation is formally structured through some sort of special cabinet level group or more informally through regular meetings of appropriate staff in the different agencies, the state must speak with one voice in its approach to market development.

Organizing the Variety of Participants

In addition to coordinated agency efforts, an effective market development strategy requires a process that identifies and includes all key constituencies. Many states have organized commissions, committees, or task forces to improve citizen and business input into policy development, organize essential participants, and solicit contributions from industries involved. In some cases, a permanent institution is created. In other cases, the organization is created to achieve a one-time or short-term agenda. The groups usually include members of the public, private, and nonprofit sectors as well as citizen and community representatives. The task forces

may deal with specific materials, several materials, or broad policy. The public-private efforts usually involve data gathering and strategic analysis, public-private collaborations, and targeted assistance to industry and local government. These task forces often represent an effort to find alternatives to regulation. Several states have experience with such groups, as the accompanying box indicates.

Examples of Organizing Participants

In Florida, the Recycling Markets Advisory Committee was established by executive order to advise the governor and legislature on steps the state could take to improve markets. The Committee is chaired by the secretaries of the Departments of Environmental Regulation and Commerce. Committee members include representatives from industry, environmental nonprofits, academia, and local and state governments. In its first report, issued in 1991, the Committee made recommendations in a variety of areas including regulatory, capital and financing, facility capacity, product demand, transportation, and quality assurance. It recommended establishment of a Recycled Materials Market Development Board to function as a high profile organization staffing policy and guiding market development in the state.

The California Recycling Market Development Commission makes recommendations on ways to expand markets for recyclable materials to the governor and assembly. Commission members include the chair of the Integrated Waste Management Board, the director of the Department of Commerce, and a private industry representative. The Commission works with California manufacturers to promote increased use of recycled materials in manufacturing processes. The Commission also helps local governments include recycling activities in their overall economic development plans.

Minnesota's Market Development Coordinating Council (MDCC) was convened by the Office of Waste Management to help coordinate market development efforts among state and local goverment and private industry. OWM staffs the MDCC and appoints its members. MDCC's responsibilities include advising the OWM on market development strategies, coordinating state responses to new market development opportunities, advising on grant and loan expenditures, and evaluating the impact of ongoing activities.

The type of institutional approach taken by a particular state will depend upon existing recycling laws, need, institutional capacity, and the political environment. Where strong state capacity exists and relatively smooth relations between public and private-sector participants, an advisory task force might be sufficient. In states beginning a push toward recycling and market development, a strong commission, one that involves all those with a stake in the outcome, is needed to be established to oversee policy development and implementation.

Multistate - Regional Activities

Barriers constraining the development of markets for secondary materials cross state boundaries. Markets often function most efficiently on a regional scale. Often The same barriers inhibiting market development in one state, such as the lack of information about recycled products, or about buyers and sellers of recycled materials and products, exist in another. Multistate efforts aimed at lowering barriers through regional market-information networks, joint procurement, shared facilities, common regulatory requirements, all help to develop and stabilize secondary materials markets. Multistate efforts offer opportunities to overcome barriers and increase the size of markets.

So far, regional organizations have used regulation and procurement as their major policy tools. These states have overcome challenges of political resistance, lack of resources, and absence of institutional vehicles through which to take joint action. Despite the challenges, some states are cooperating with each other to set up regional markets, as the accompanying box indicates.

Examples of Multistate Cooperation

The states belonging to the Eastern Conference of the Council of Governments joined forces several years ago to form the Northeast Recycling Council (NERC). Representatives of the lead recycling agendas of six New England and four Middle Atlantic states meet on a regular basis to commission studies, review policy options, and coordinate efforts. One of NERC's many accomplishments was presenting a united front to the newspaper publishing industry to convince them of the states' seriousness in considering alternatives, including regulation, to promote markets for recycled newsprint.

Seven upper-Midwest states have joined the lead set by Minnesota and Wisconsin in developing a joint procurement program for 32 million pounds of high-speed copying paper. The effort, led by the Council of Great Lakes Governors, includes New York, Pennsylvania, Ohio, Indiana, Michigan, Illinois, Wisconsin, Minnesota, plus South Dakota. The states have set consistent content specifications (50 percent recycled and 10 percent post-consumer content), and allow bidders to go for a portion (one state or more) or the whole contract.

These states expect to benefit from the cooperative purchasing with discount savings on such large volumes plus less stress on the environment. Some states have laws prohibiting them from joining cooperative purchasing arrangements. Officials in Michigan and Ohio had to ask the legislatures to change these.

The Council of Great Lakes Governors is exploring the feasibility of extending their cooperative market development efforts to include other materials, such as rerefined oil for passenger vehicles. It also has created a Great Lakes standards board for testing new recycled products for possible procurement. Sharing information about product testing avoids repetition and costs for each state.

Creating New or Adding to Existing Programs

To promote market development, many states have created new programs. Sometimes these initiatives result in the creation of a new agency; other times, existing operations are expanded. For example, most states have supported procurement of recycled materials but none has created a separate office for that purpose. Instead, purchasing agents have expanded their repertoire.

Most states have created new financing programs for firms involved in the processing or manufacturing of recycled materials and housed these new programs in a new office at the state environmental agency. However, in a few cases, states have run market development financing programs through existing development-finance agencies.

Both approaches, creating new offices and expanding existing ones, can have merit. By expanding the scope of existing agencies, the state taps the expertise of people skilled in a particular type of assistance. Experienced procurement agents or development finance loan officers are examples. Tie-ins with existing agencies usually offer a broader reach for market

development as well as the opportunity to incorporate the materials-policy goals into other program activities.

Creating new offices offers the benefit of using staff with a special understanding of client needs and commitment to particular issues. Even if they duplicate the general type of assistance offered by existing agencies, new offices are sometimes necessary to show the old guard new approaches. However, folding market development functions into existing agency activities usually is cheaper, and it may be difficult to justify the advantages of a new office. It's not likely that states would want to create new offices that are similar to others in most ways except for a recyclables focus, unless the existing agency is simply not appropriate for the market development function.

Funding Materials-Policy Programs

States have developed a variety of approaches to finance their recycling and market development activities. States' most common approach is direct appropriations, treating their recycling activities like other public activities. However, sole dependence on annual general fund appropriations may hamper recycling and market development activities by limiting their ability to develop the needed longer-term approaches and solutions.

Some states have avoided the limitations of direct appropriations by adding other sources of support for general programs and material-specific programs. In some states activities are supported by a dedicated revenue source, as the accompanying box shows. In addition, some states have developed specific taxes or fees on problem materials to finance specific efforts related to that product. These fees usually are placed on bulky, problem items—scrap tires, used oil, white goods. These types of taxes have several advantages. The tax can be easily phased out on a predetermined time schedule. Because the tax is dedicated to a specific problem and use, it should be more acceptable to the public. Such a tax also is easily administered. The accompanying box describes material-specific fees.

While not a reliable source of revenue, industry contributions might be a source of financing in some cases. For example, an effective used oil recycling system requires the active involvement of lube oil manufacturers, distributors, and sellers. Canadian petroleum products manufacturers offered $15 million to education and collection programs. U.S. lube oil firms could offer some funds to solve the used oil disposal problems in states where they operate or sell products.

Examples of Dedicated Revenue Sources

Wisconsin passed an income-tax surcharge on all businesses in 1991 as part of its comprehensive recycling law. This surcharge is expected to raise more than $30 million for recycling. A number of states place a tax or disposal fee based on the amount of waste involved. These fees range from 25 cents a ton in California to $6.00 a ton in Vermont. In most cases, only a portion of the revenue generated goes toward supporting the state's recycling efforts.

Washington and Minnesota passed legislation to impose a sales tax on garbage collection. Minnesota's tax is a six percent sales tax on garbage collection; Washington adds a surcharge of one percent to garbage bills to pay for the state's recycling program. Nebraska, Ohio, and Virginia use litter taxes to finance part of their recycling efforts. These taxes, directed at manufacturers, wholesalers, and retailers, place a tax on "litter generating products." For example, the Virginia Litter Tax Act imposes a minimal tax of $10 on all firms and $25 for firms that sell groceries, beverages, and beer. A few states have passed or attempted to pass large general obligation bonds specifically earmarked for environmental uses. While such an effort would not pass in New York, in Michigan the Protect Michigan's Future bond issue succeeded. This bond issue, which covers a wide range of environmental activities, provided $150 million to finance the state's Solid Waste Alternatives Program, a comprehensive strategy for resolving its solid waste crisis.

Examples of Material Fees

A number of states, including Minnesota and Washington, impose fees on tires at the point of sale; the funds are dedicated to scrap-tire management. These fees range from 25 cents to $2.00 per tire, with $1.00 the most common.

Rhode Island places disposal fees on lubricating oil (20 cents per gallon), automobile tires (50 cents each) and household appliances. The funds collected are used for educational and technical assistance for collecting and recycling of these used materials. The state also has a one percent tax on tires to fund mandated county disposal sites and programs. These programs can include tire incineration, pyrolysis, crumb rubber production, sludge composting, and landfilling of shredded tires.

Florida has a unique advance-disposal fee for containers. If the recycling rate for containers sold at the retail level does not hit 50 percent by October 1995, the state will assess an advance-disposal fee of two cents per container. The collected fees will be refunded to registered recyclers and used to finance recycling programs. Wisconsin, Illinois, and New Hampshire have pending legislation that would put an excise tax on the sale of disposable diapers. Maine places an advance-disposal fee of $5 on new major appliances, new major furniture, new bathtubs, and new mattresses.

Appendix

Comparative Strategic Analysis for Old Newspapers, Used High Grade Office Paper, and Used Oil

The three strategic materials analyses that follow clearly indicate that the sources of market failure and the solutions for overcoming them vary greatly material by material. Markets and barriers for each material and each end use are idiosyncratic, so the crafting of policies and programs must be as well.

Old Newspaper

In recent years, the success of newspaper recovery efforts and the threat and actuality of old newspaper (ONP) gluts have focused attention on market development for ONP. States spearheading the market development effort have identified recycled newsprint as the key target end-use for a number of reasons: recycled newsprint was a high value-added product that could be recycled numerous times; newspaper publishers constituted the largest potential new market for recycled ONP; and newsprint demand is relatively stable over time.

Several years ago, the key barrier to market development was the relative disinterest of newspaper publishers in using recycled newsprint. The primary sources of this disinterest were misinformation about the technical quality of ONP (particularly concerns about printability and runnability), lack of recycled newsprint supply, and a pricing structure that did not reflect the environmental benefits of recycled newsprint. The newsprint manufacturers, with their sunk costs in forests and virgin pulp mills, had little incentive to invest massive amounts of money for deinking pulp lines. They faced significant opportunity costs because they owned large forests and had just completed a set of major investments in new mill equipment.

The leverage point for action in creating a recycled newsprint market is the newspaper publishers—if they provide a strong demand for ONP, each newsprint mill has little choice but to go along if it wants to maintain market share. Realizing this, a number of states used two types of tools on the newspaper publishers to demand recycled newsprint—information and regulation. Information was provided to the publishers indicating that recycled newsprint performed adequately. Information about the situation also was provided to the public. In particular, public opinion was aroused in favor of using recycled newsprint—as businesses dependent on the favor of one regional market and seeking to be portrayed as good corporate citizens, newspaper publishers felt public pressure to pledge to buy recycled newsprint.

From several states the publishers also faced regulations or the threat of regulations requiring that a minimum percentage of their newsprint have recycled content. Such a move was appropriate for several reasons. First, the requirements of regulation were achievable by the publishers and enforceable by the state. Proposed or enacted regulations are achievable because they require publishers to use recycled newsprint only if it is available. The regulations are enforceable because newsprint is an homogeneous product with a very small number of buyers and sellers. The states only have to worry about overseeing a small number of users in their use

of one product. (Contrast this situation to that for recycled office paper in which there are hundreds of thousands of purchasers, thousands of distributors, and hundreds of product types. As we will discuss, regulation in this situation is difficult and costly to enforce.)

Only a handful of states actually passed legislation mandating recycled content. But those few laws stimulated newspaper publisher associations in a larger number of states to seek to avoid such legislation by negotiating voluntary agreements with policymakers to use a significant amount of recycled newsprint in the future. Moreover, the American Newspaper Publishers Association, most of the nation's major newspaper chains (e.g., Gannett, Knight-Ridder, Newhouse), and key individual newspapers (e.g., the Washington Post, the New York Times) made similar pledges.

Once the newspaper publishers were committed to using recycled newsprint, the pressure was transferred to the newsprint mills. The mills realized that the newspaper publishers had to make good on their promises. Despite the fact that many had just undertaken massive capital expenditures for virgin production, fear of losing market share stimulated most major manufacturers, and a number of smaller ones, to undertake a new round of capital investment and build deinking facilities—a large number have or soon will come on line.

While vigorously pursuing development of the recycled newsprint market, officials in a number of states also realized that ONP markets needed diversity as well. These states, particularly in the Northeast, reviewed options for promoting the operation of facilities using ONP in making recycled boxboard, cellulose insulation, animal bedding, hydro seeding, gypsum linerboard, and molded pulp products. In addition, they examined options for promoting ONP exports. Several initiatives to facilitate such operations have been undertaken, such as providing financing to reopen shuttered boxboard mills, seeking to attract cellulose insulation plants, and promoting the use of ONP-based animal bedding among farmers. Space does not permit a detailed review of the barriers to and options for each of these end-uses.

Used Office Paper

At this point in time, states have focused less effort on market development for used office paper. Based on our criteria for priority end-uses, the most attractive end market is recycled printing and writing paper. First, it is a high valued-added product that can be recycled again and again. Tissue is an important market, but does not have the virtue of being easily recyclable itself. The recycled printing and writing market also has enormous growth potential over the long-term.

The sources of market failure for recycled printing and writing paper include, but extend beyond, those found for recycled newsprint. Concerns about obtaining a reliable and uncontaminated supply of high-grade paper are far greater in the printing and writing industry than in the newsprint industry. In many states, large waste collectors in office buildings prefer to collect mixed paper rather than separated high grades—the mixed paper is aimed at the export market. In addition, it simply is much harder to source separate uncontaminated high grades usable by recycled paper mills. Current technology has not allowed adequate deinking of plasticized inks, those from lasers and copiers. It is very difficult and time-consuming to adequately sort the various types of used office paper, particularly paper with plasticized ink (copier-printed, laser-printed) from those printed with oil- or soy-based inks.

Another market failure for the printing and writer paper market is the lack of market deinked pulp capacity. Printing and writing mills are far less likely to build their own deinking operations because the cost is high relative to volume. Therefore, there is an opportunity and need for third-party ("market") deinked pulpers, firms that would make and sell deinked pulp to a number of mills. However, firms that could operate such mills have been slow to react to the market opportunity due to lack of information about mill demand, supply uncertainty, and risk aversion.

Many printing and writing mills lack information about state-of-the-art deinking technology and techniques. Paper distributors lack complete information about the quality of recycled paper. Commercial printers and consumers lack information about the quality and sources of recycled paper. Consumers face high prices for recycled paper because of small production runs—high prices reduce demand. Finally, paper labeled "recycled" may have no post-consumer content, but be made of mill waste. Consequently, buying "recycled" is no guarantee that used office paper is being remanufactured.

As with recycled newsprint, the obvious key point of leverage is the end-user—office supply buyers, particularly. Paper distributors and mills are also potential points of leverage. Like newsprint, information is an important part of the strategy, but in this case, a wider variety of information would be provided to office building managers and custodians about the virtues and methods of separating high grades from low grades; to manufacturers about how to deink and the virtues of a recycled paper market; to potential and existing market pulp makers about market demand; and to distributors and buyers about the quality and sources of recycled newsprint. In particular, information campaigns targeted to trade associations such as local paper distributors association and the local chapter of the National Association of Purchasing Managers are appropriate.

However, unlike recycled newsprint, regulation is not a particularly viable option to stimulate demand by end-users. While newsprint has a relative handful of buyers and sellers for an homogeneous product, for printing and writing paper there are hundreds of manufacturers and distributors and thousands of users of a heterogeneous group of products. To be effective, the requirements of regulation must be achievable and enforceable—requiring buyers to purchase recycled products would be neither. Regulating in-state distributors would likely contribute to a shift to mail order or even black market activities. Since a primary source of market failure is undervaluation, a surtax on virgin paper is attractive, but a recent Supreme Court ruling says that states cannot enforce collection of a sales tax on sellers based out of state.

To say that regulation of end-users is not viable is not to say that regulation of other actors is not appropriate. First, the state environmental permitting process could be adjusted in such a way as to encourage waste haulers to separate their high grades from low-grade waste paper. Second, it is feasible to require that any paper labeled "recycled" have some minimum amount of post-consumer content.

In addition, it is clear that government buy-recycled requirements are a much better option for recycled office paper than for recycled newsprint, since government purchases such a high percentage of total production of office paper and such a low percentage of newsprint. And it is an appropriate option by state government to require local governments to set up their own buy-recycled programs as well.

As with old newspapers, promoting diversity of end-uses is important. Because high-grade used office paper is difficult to separate from lower grades, end-uses for mixed paper will continue to be important of necessity. The bulk of such paper is used in recycled paperboard, so market share for this end-use should continue to be encouraged. Recycled tissue products now take half of the office paper high grades, so continuing to encourage that end market is important as well. Exports, particularly of mixed grades, are critical—foreign buyers with access to cheaper labor like buying mixed grades and having the material hand separated. Space does not permit a detailed review of the barriers to and options for each of these end uses.

Used Oil

Used oil is a good example of a material for which the difficulty in market development is not in reprocessing, but in collection and current regulation. Markets dear for used oil; that is, there are buyers for this material. Because of the structure of the oil reprocessing and rerefining industries—which can easily add additional capacity and find ready markets for reprocessed or rerefined used oil products—increased amounts of collected used oil are sought by rerefiners or reprocessors. And because there is no glut of used oil sitting around, used oil is seldom seen as a priority material for market development.

However, millions of gallons of used oil are dumped into the ground each year, causing severe environmental degradation. The one major barrier to market development is inability to capture the massive amounts of oil being poured down the drain by waste generators, particularly those do-it-yourselfers (DIYs) and small business generators (e.g., farms, marinas). Clearly, one cause of this situation is that these waste generators are undervaluing the environmental cost of not taking the oil to a local garage. Second, a serious problem for DIYs who do seek drop off sites is the reluctance of local gas stations and other oil handlers to accept used oil because of fears and costs related to hazardous waste liability.

For used oil market development, the primary focus needs to be on the waste generator and the primary activity to develop a collection infrastructure to capture the millions of gallons of improperly disposed used oil. Because adequate processing infrastructure exists, an increased volume of collected used oil could be readily absorbed. Several tacks can be taken. There are a variety of information-oriented actions that state government, working with local governments and the oil products industry, can take to promote used oil recycling among DIY and small business generators. The information and education efforts should describe the importance of proper used oil disposal, how and where to recycle used oil, how to reduce used oil generation, the source for further information, and the penalties for dumping. Specific endeavors could include a brochure on recycling used oil, a toll-free recycling hotline, school curricula for used oil recycling, technical assistance to local governments and organizations trying to establish used oil collection programs, and public service announcements.

Clearly, a curbside pickup program for used oil could have a very positive impact, if feasible. For ongoing regular collection of used oil, the state could work with and encourage local governments to include used oil in curbside recycling collection, if available, or regular garbage collection. This effort involves relatively straightforward technical assistance outreach to local governments, curbside recyclers, and garbage haulers. The state could provide financial incentives as well. In general, however, financial incentives are not likely to work well to

promote further collection—the improper disposal of oil by DIYs is not a function of financial cost.

Regulatory actions can play an important role. First, the state could more clearly define and prohibit improper disposal of used oil and create severe penalties for dumping or improper burning. But while this regulatory action is necessary, it is not sufficient to establish disincentives for dumping used oil. Better systems for collection must be put in place, so the disincentive of inconvenience is overcome. Thus, a state could require all service stations, quick lube shops, and auto supply stores to accept used oil from the public.

As a lesser action, the state can require information at point-of-purchase such as include container labeling and signage. Any establishment that sells lubricating oil could be required to display a sign exhorting the public to recycle used oil and offer the brochures described above. In addition, the oil lubricating producers could be required to put a used oil recycling message on the new lubricating oil container, including a plea to recycle used oil and the toll-free hotline number for information.

Finally, the state could test the feasibility of a program to design, manufacture, distribute, and reuse special containers for collecting and transporting DIY oil. The effort should evaluate existing container products, specify an existing container product or design specification, and identify opportunities for in-state manufacture either by a firm already producing the product or by an in-state manufacturer with the capability to produce the containers from recycled plastic. Recycling instructions and information could be attached to each container. The container design should allow for stacking and easy transport by collectors. The container program evaluation could examine options for distributing new containers to retail outlets; collecting filled containers from curbside and drop off collection sites; and emptying, cleaning, and returning the containers to retail and other outlets for reuse. In addition to improving curbside and drop off collection efforts, the container program has state and local economic development potential through the creation of new enterprise. Means for developing and promoting a special container program could include elements of information, regulation, direct financing, grants, and procurement.